

Service Service Service



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Service Manual

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

- 1.1 Technical Specifications
- 1.2 Connections
- 1.3 Chassis Overview

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

1.1 Technical Specifications

1.1.1 Vision

Display type	: LCD-IPS
Screen size	: 30" (76 cm), 15:9
Resolution (HxV pixels)	: 1280x768
Contrast ratio	: 600:1 (AUO)
	: 500:1 (LPL)
Light output (cd/m ²)	: 600 (AUO)
	: 500 (LPL)
Viewing angle (HxV degrees)	: 170x170
Tuning system	: PLL
TV Color systems	: NTSC M 3.58
Video playback	: NTSC M 3.58
Supported computer formats	: VGA (640x480)
	: VGA (720x400)
	: VGA (640x350)
	: MAC (640x480)
	: MAC (832x624)
	: SVGA (800x600)
	: XWGA (1024x768)
	: WXGA (1280x768)
Supported video formats	: PAL 576i 1fH CVI
	: NTSC 480i 1fH CVI
	: PAL 576p 2fH HD
	: NTSC 480p 2fH HD
	: ATSC 720p 2fH HDMI
	: ATSC 1080i 2fH HDMI
Channel selections	: 120 presets
	: VHF
	: UHF
	: S-band
	: Hyper-band
Aerial input	: 75 ohm, Coax
	: F-type

1.1.2 Sound

Sound systems	: BTSC
Maximum power (W _{RMS})	: 2 x 15 (int.)

1.1.3 Miscellaneous

Power supply:	
- AC Power voltage (V _{AC})	: 108 - 132
- AC Power frequency (Hz)	: 60

Ambient conditions:	
- Temperature range (deg. C)	: +5 to +40
- Maximum humidity	: 90% R.H.

Power consumption	
- Normal operation (W)	: 185
- Standby (W)	: < 2

Dimensions (WxHxD) in cm	: 89.1x48.9x11.0
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Weight (kg)	: 18
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1.2 Connections

Note: The following connector color abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Rear I/O Connections

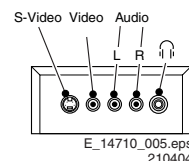


Figure 1-1 Rear I/O connections (part 1)

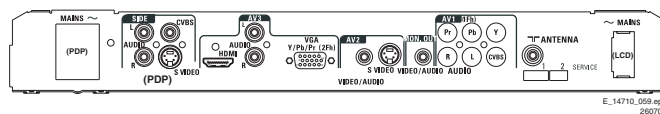


Figure 1-2 Rear connections (part 2)

SIDE Cinch: CVBS - In, Audio - In

Rd - Audio R	0.5 V _{RMS} / 10kohm	⊕ ⊖
Wh - Audio L	0.5 V _{RMS} / 10kohm	⊕ ⊖
Ye - Video CVBS	1 V _{PP} / 75 ohm	⊕ ⊖

SIDE SVHS: Y/C - In

1 - Ground Y	Gnd	⊥
2 - Ground C	Gnd	⊥
3 - Video Y	1 V _{PP} / 75 ohm	⊕ ⊖
4 - Video C	0.3 V _{PP} / 75 ohm	⊕ ⊖

AV3 HDMI: Digital Video - In, Digital Audio - In

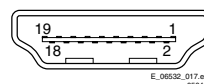
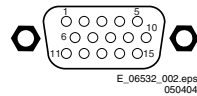


Figure 1-3 HDMI (type A) connector

1 - D2+	Data channel	⊕ ⊖
2 - Shield	Gnd	⊥
3 - D2-	Data channel	⊕ ⊖
4 - D1+	Data channel	⊕ ⊖
5 - Shield	Gnd	⊥
6 - D1-	Data channel	⊕ ⊖
7 - D0+	Data channel	⊕ ⊖
8 - Shield	Gnd	⊥
9 - D0-	Data channel	⊕ ⊖
10 - CLK+	Data channel	⊕ ⊖
11 - Shield	Gnd	⊥
12 - CLK-	Data channel	⊕ ⊖
13 - n.c.		
14 - n.c.		
15 - DDC_SCL	DDC clock	⊕ ⊖
16 - DDC_SDA	DDC data	⊕ ⊖
17 - Ground	Gnd	⊥
18 - +5V		⊕ ⊖
19 - HPD	Hot Plug Detect	⊕ ⊖
20 - Ground	Gnd	⊥

AV3 Cinch: Audio - In

Wh - Audio L	0.5 V _{RMS} / 10 kohm	⊕ ⊖
Rd - Audio R	0.5 V _{RMS} / 10 kohm	⊕ ⊖

AV3 VGA: Video 2fH RGB - In**Figure 1-4 VGA Connector**

1	- Video Red	0.7 V _{PP} / 75 ohm	⊕
2	- Video Green	0.7 V _{PP} / 75 ohm	⊕
3	- Video Blue	0.7 V _{PP} / 75 ohm	⊕
4	- n.c.		
5	- Ground	Gnd	⊥
6	- Ground Red	Gnd	⊥
7	- Ground		
8	- Green	Gnd	⊥
9	- Ground Blue	Gnd	⊥
10	- +5V_DC	+5 V _{DC}	⊕
11	- Gnd Sync	Gnd	⊥
12	- n.c.		
13	- DDC_SDA	DDC data	⊕
14	- H-sync	0 - 5 V	⊕
15	- V-sync	0 - 5 V	⊕
16	- DDC_SCL	DDC clock	⊕

AV2 Mini Jack: Video 1fH CVBS - In, Audio - In

1	- Audio R	0.5 V _{RMS} / 10 kohm	⊕
2	- Gnd CVBS	Gnd	⊥
3	- Video CVBS	1 V _{PP} / 75 ohm	⊕
4	- Audio L	0.5 V _{RMS} / 10 kohm	⊕

AV2 SVHS: Video 1fH Y/C - In

1	- Ground Y	Gnd	⊥
2	- Ground C	Gnd	⊥
3	- Video Y	1 V _{PP} / 75 ohm	⊕
4	- Video C	0.3 V _{PP} / 75 ohm	⊕

Monitor Out Mini Jack: Video CVBS - Out, Audio - Out

1	- Audio R	0.5 V _{RMS} / 10 kohm	⊕
2	- Gnd CVBS	Gnd	⊥
3	- Video CVBS	1 V _{PP} / 75 ohm	⊕
4	- Audio L	0.5 V _{RMS} / 10 kohm	⊕

AV1 Cinch: Video 1fH CVBS/YpBPr - In, Audio - In

Rd	- Video Pr	0.7 V _{PP} / 75 ohm	⊕
Rd	- Audio R	0.5 V _{RMS} / 10 kohm	⊕
Wh	- Video Pb	0.7 V _{PP} / 75 ohm	⊕
Wh	- Audio L	0.5 V _{RMS} / 10 kohm	⊕
Gn	- Video Y	1 V _{PP} / 75 ohm	⊕
Ye	- Video CVBS	1 V _{PP} / 75 ohm	⊕

Aerial - In

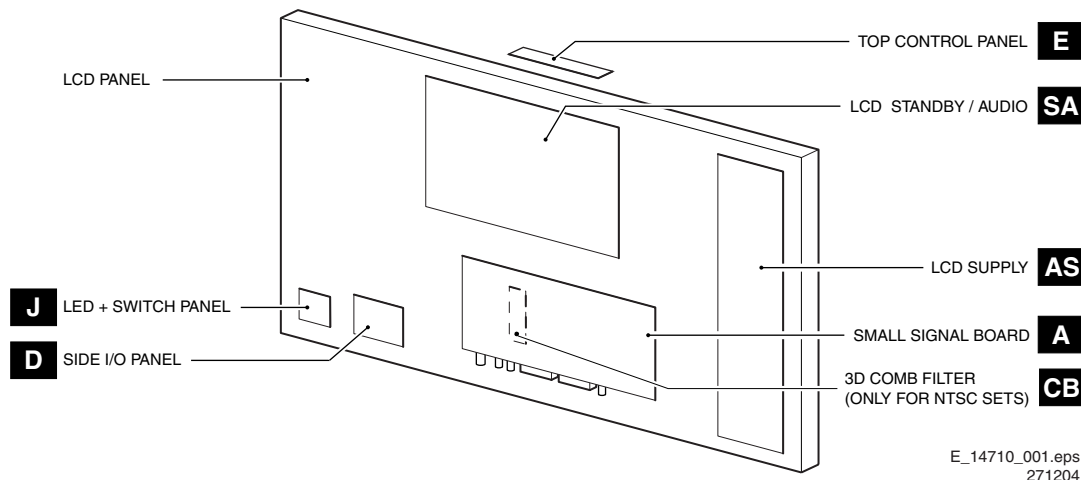
-	- F-type	Coax, 75 ohm	⊥
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Service connector 1 (UART)

1	- UART_TX	Transmit data	⊕
2	- Ground	Gnd	⊥
3	- UART_RX	Receive data	⊕

Service connector 2 (ComPair)

1	- SDA-S	I ² C Data (0 - 5 V)	⊕
2	- SCL-S	I ² C Clock (0 - 5 V)	⊕
3	- Ground	Gnd	⊥

1.3 Chassis Overview**Figure 1-5 CBA locations**

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

- 2.1 Safety Instructions
- 2.2 Warnings
- 2.3 Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:

- Connect the set to the AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ▲). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential. Available ESD protection equipment:
 - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
 - Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (↕), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the

Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).

- Where necessary, measure the waveforms and voltages with (⏏) and without (⏏) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓜ) and in stand-by (Ⓜ). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.
- Manufactured under license from Dolby Laboratories. "Dolby" and the "double-D symbol", are trademarks of Dolby Laboratories.

2.3.2 Schematic Notes

- All resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads (μ = $\times 10^{-6}$), nano-farads (n= $\times 10^{-9}$), or pico-farads (p= $\times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts list. Therefore, always check this list when there is any doubt.

2.3.3 Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, it is essential when removing an (LF)BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB. To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA. Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.

After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.

Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device Replacement

The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information

For more information on how to handle BGA devices, visit this URL: www.atyourservice.ce.philips.com (needs subscription, not available for all regions). After login, select "Magazine", then go to "Workshop Information". Here you will find Information on how to deal with BGA-ICs.

2.3.4 Lead Free Solder

Philips CE is going to produce lead-free sets (PBF) from 1.1.2005 onwards.

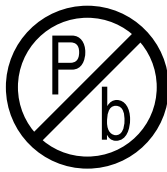


Figure 2-1 Lead-free logo

This sign normally has a diameter of 6 mm, but if there is less space on a board also 3 mm is possible.

Regardless of this logo (is not always present), one must treat all sets from this date onwards according to the following rules.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able
 - To reach at least a solder-tip temperature of 400°C.
 - To stabilise the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C - 380°C is reached and stabilised at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec.

Avoid temperatures above 400°C, otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.

- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to avoid mixed regimes. If not to avoid, clean carefully the solder-joint from old tin and re-solder with new tin.
- Use only original spare-parts listed in the Service-Manuals. Not listed standard material (commodities) has to be purchased at external companies.
- Special information for lead-free BGA ICs: these ICs will be delivered in so-called "dry-packaging" to protect the IC against moisture. This packaging may only be opened short before it is used (soldered). Otherwise the body of the IC gets "wet" inside and during the heating time the structure of the IC will be destroyed due to high (steam-)pressure inside the body. If the packaging was opened before usage, the IC has to be heated up for some hours (around 90°C) for drying (think of ESD-protection!).
Do not re-use BGAs at all!
- For sets produced before 1.1.2005, containing leaded soldering tin and components, all needed spare parts will be available till the end of the service period. For the repair of such sets nothing changes.

In case of doubt whether the board is lead-free or not (or with mixed technologies), you can use the following method:

- Always use the highest temperature to solder, when using SAC305 (see also instructions below).
- De-solder thoroughly (clean solder joints to avoid mix of two alloys).

Caution: For BGA-ICs, you **must** use the correct temperature-profile, which is coupled to the 12NC. For an overview of these profiles, visit the website www.atyourservice.ce.philips.com (needs subscription, but is not available for all regions) You will find this and more technical information within the "Magazine", chapter "Workshop information". For additional questions please contact your local repair help desk.

2.3.5 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions - reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3. Directions for Use

You can download this information from the following websites:

<http://www.philips.com/support>
<http://www.p4c.philips.com>

4. Mechanical Instructions

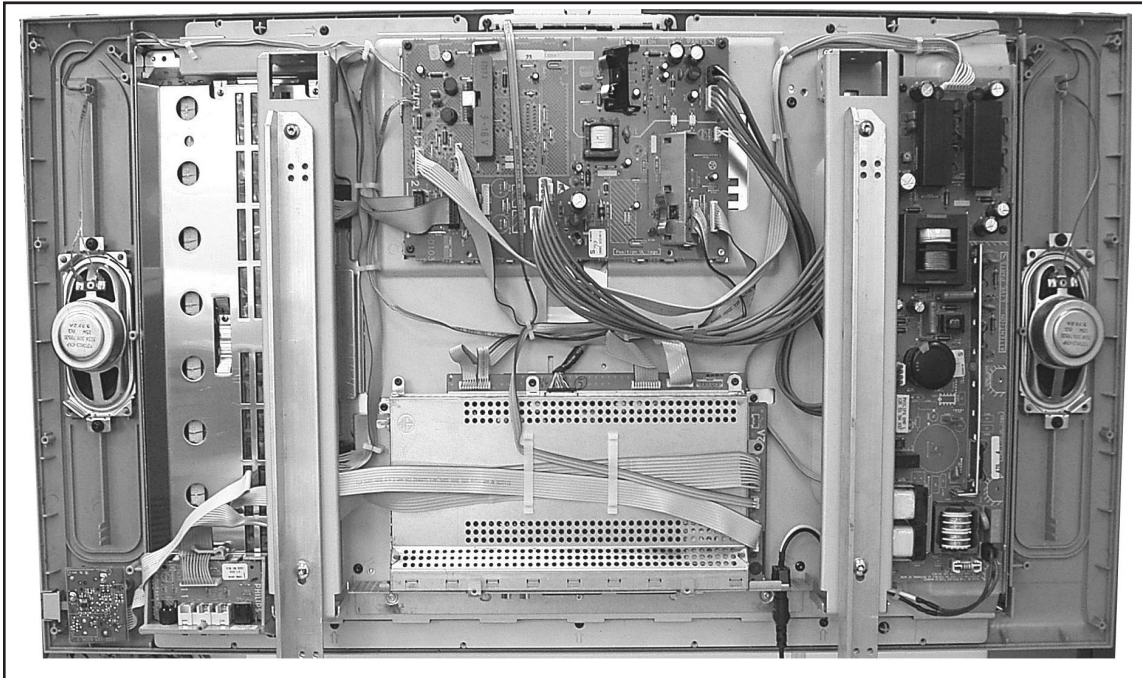
Index of this chapter:

- 4.1 Cable Dressing
- 4.2 Service Positions
- 4.3 Assy/Panel Removal
- 4.4 Set Re-assembly

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order.

4.1 Cable Dressing



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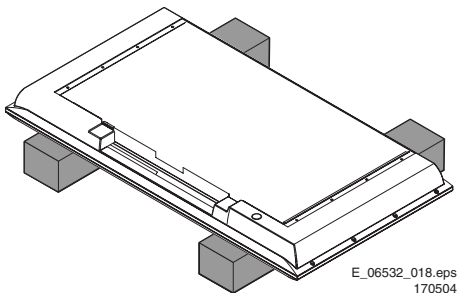
Figure 4-1 Cable dressing

4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:

- The buffers from the packaging (see figure "Rear cover").
- Foam bars (created for service).
- Aluminium service stands (created for Service).

4.2.1 Foam Bars

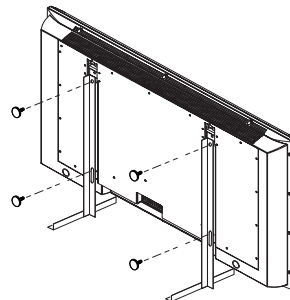


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Figure 4-2 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By placing a mirror under the TV, you can monitor the screen.

4.2.2 Aluminium Stands



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Figure 4-3 Aluminium stands (drawing of Mkl)

The aluminium stands (order code 3122 785 90480) can be mounted with the back cover removed or still left on. So, the stand can be used to store products or to do measurements. It is also very suitable to perform duration tests without taking much space, without having the risk of overheating, or the risk of products falling. The stands can be mounted and removed quick and easy with use of the delivered screws that can be tightened and loosened manually without the use of tools. See figure above.

Note: Only use the delivered screws to mount the monitor to the stands.

4.3 Assy/Panel Removal

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before you remove the rear cover.

1. Remove the screws, which secure the rear cover. The screws are located at the top, bottom, left and right sides; next to the Side/IO and Rear connections. There are also three deeper located screws next to the stands.
2. Lift the rear cover from the cabinet. Make sure that wires and flat foils are not damaged during cover removal.

4.3.2 Side I/O Panel

1. Disconnect the cable from the panel.
2. To replace the complete bracket, remove the two fixation screws on either side of the panel.
3. Release the two fixation clamps and lift the panel out of the bracket.

4.3.3 LED/Switch Panel

1. Remove the two fixation screws.
2. Disconnect the cable from the rear of the panel.

4.3.4 Top Control Panel

1. Remove the two fixation screws.
2. Release the two fixation clamps and lift the panel out of the bracket.

4.3.5 Small Signal Panel (SSB) and 3D Comb Filter

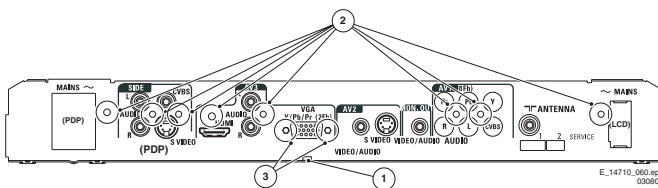
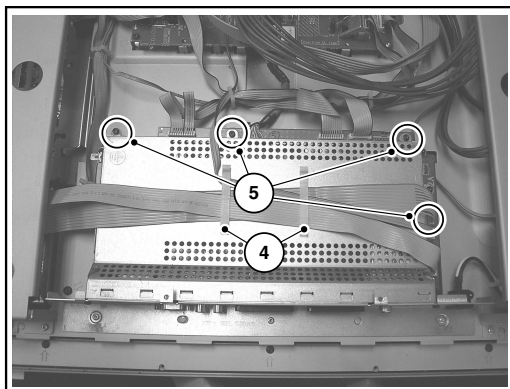


Figure 4-4 SSB Connector plate



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Figure 4-5 Shielding of the SSB

1. Remove the middle fixation screw (1) from the bottom side of the connector plate (as this holds the SSB bracket).
Note: Sometimes it is easier to loosen the complete connector plate and remove it together with the SSB.
2. Remove all connector fixation screws (2) from the front side of the connector plate.

3. Remove the two female screw locks (3) of the VGA connector.
4. Release the plastic cable clips (4) on the shielding and disconnect all cables from the SSB.
Note: Be careful with the fragile LVDS connector on the SSB.
5. Now, completely remove the SSB (together with all the shieldings) from the set.
6. Once the SSB is out, remove the fixation screws (5) from the shielding.
7. Remove the shielding, it hinges at the left side (acc. photo).
8. Remove the fixation screws that hold the panel, and take out the panel. On the rear side of the SSB, the **3D Comb Filter** is mounted with plastic clips.

Notes:

- Pay special attention to the EMC foam on the SSB shielding. These must be replaced in their initial positions during set re-assembly.
- Insulate the tuner pins, so they cannot touch the shielding (see also figure "SDM Service jumper" in Chapter 5).

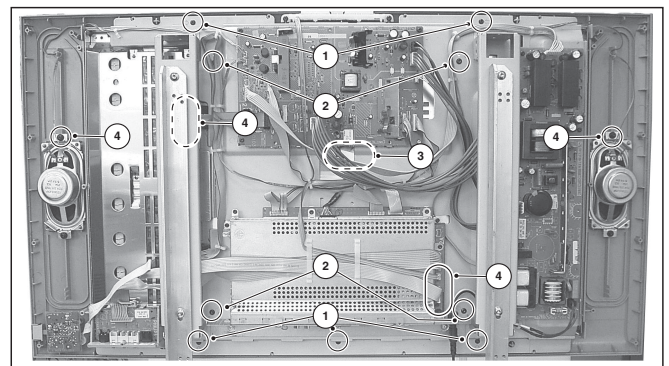
4.3.6 LCD Supply Panel

1. Disconnect all cables from the panel.
2. Remove the fixation screws and take out the panel.

4.3.7 LCD Standby/Audio Panel

1. Disconnect all cables from the panel.
2. Remove the fixation screws and take out the panel.

4.3.8 LCD Panel



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Figure 4-6 LCD panel disassembly

1. Remove the T10 screws (1) from the mounting frame.
2. Remove all mounting LCD panel T20 screws (2).
3. **Important:** Unplug the LVDS connector (3) at the LCD panel. **Be careful**, as this is a very fragile connector!
4. Unplug the following connectors (4).
 - LCD back light (disconnect at the LCD side)
 - Loudspeaker (easiest to disconnect at the speaker and to release the cable holders a little).
 - Top Control cable (disconnect at SSB side).
 - Cable between LED/Switch panel and SSB.
5. Lift the metal frame (together with all CBAs) from the LCD panel.
6. After removal of the frame, you can lift the LCD display from the set.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See figure "Wire dressing".
- Pay special attention not to damage the EMC foams at the SSB shielding. Check that EMC foams are put correctly in place.

5. Service Modes, Error Codes, and Fault Finding

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- 5.1 Test Points
- 5.2 Service Modes
- 5.3 Problems and Solving Tips Related to CSM
- 5.4 ComPair
- 5.5 Error Codes
- 5.6 The Blinking LED Procedure
- 5.7 Fault Finding and Repair Tips

5.1 Test Points

This chassis is equipped with test points in the service printing. In the schematics test points are identified with a rectangle box around Fxxx or lxxx. These test points are specifically mentioned in the service manual as "half moons" with a dot in the centre.

Perform measurements under the following conditions:

- Television set in Service Default Alignment Mode.
- Video input: Color bar signal.
- Audio input: 3 kHz left channel, 1 kHz right channel.

5.2 Service Modes

Service Default mode (SDM) and Service Alignment Mode (SAM) offers several features for the service technician, while the Customer Service Mode (CSM) is used for communication between the call centre and the customer.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the abilities of structured troubleshooting, error code reading, and software version read-out for all chassis.

Minimum requirements for ComPair: a Pentium processor, a Windows OS, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a predefined setting for measurements to be made.
- To override software protections.
- To start the blinking LED procedure.
- To inspect the error buffer.
- To check the life timer.

Specifications

Table 5-1 SDM default settings

Region	Freq. (MHz)	Default system
Europe, AP-PAL/Multi	475.25	PAL B/G
NAFTA, AP-NTSC, LATAM	61.25 (ch. 3)	NTSC M

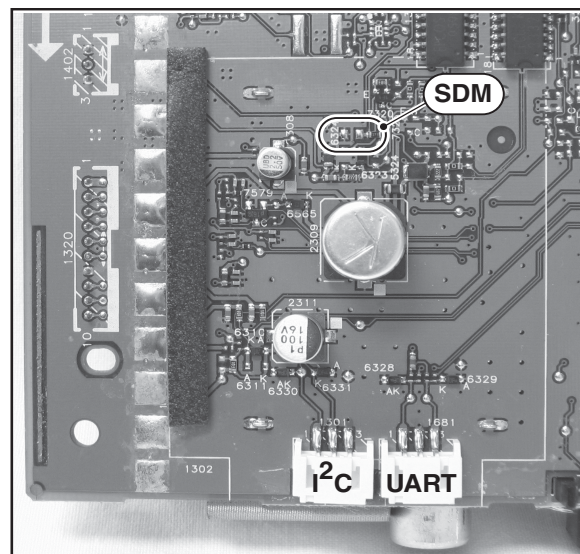
- All picture settings at 50% (brightness, color contrast, hue).
- Bass, treble and balance at 50%; volume at 25%.
- All service-unfriendly modes (if present) are disabled. The service unfriendly modes are:
 - Timer / Sleep timer.
 - Child / parental lock.
 - Blue mute.
 - Hotel / hospital mode.
 - Auto shut off (when no "IDENT" video signal is received for 15 minutes).
 - Skipping of non-favourite presets / channels.
 - Auto-storage of personal presets.
 - Auto user menu time-out.
 - Auto Volume Levelling (AVL).

How to enter

To enter SDM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the MENU button (do not allow the OSD display to time out between entries while keying the sequence).
- Short SDM jumper (item 4022, see Figure "Service jumper") on the TV board and apply AC Power. Remove the short after start-up.

Caution: Entering SDM by shorting "Service" jumpers will override the software protections. Do this only for a short period. **When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.**



E_14710_062.eps
260804

Figure 5-1 SDM Service jumper

After entering SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Alignment Mode.

```
00022 LC42EP1 2.03/S42GV1 2.02  SDM
ERR 0 0 0 0 0
OP 000 057 140 032 120 128 000
```

E_14710_006.eps
240604

Figure 5-2 SDM menu (example from LC4.2E)

How to navigate

When you press the MENU button on the remote control, the set will switch on the normal user menu in the SDM mode.

How to exit

Switch the set to STANDBY by pressing the POWER button on the remote control transmitter.

If you turn the television set off by removing the mains (i.e., unplugging the television) or by using the POWER button on the TV set, the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, Error codes, and Option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (Tuner, White Tone, Geometry, and Audio).
- NVM Editor.
- ComPair Mode switching.

How to enter

Press the following key sequence on the remote control transmitter: **"062596"** directly followed by the OSD/STATUS/INFO button (do not allow the OSD display to time out between entries while keying the sequence).

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

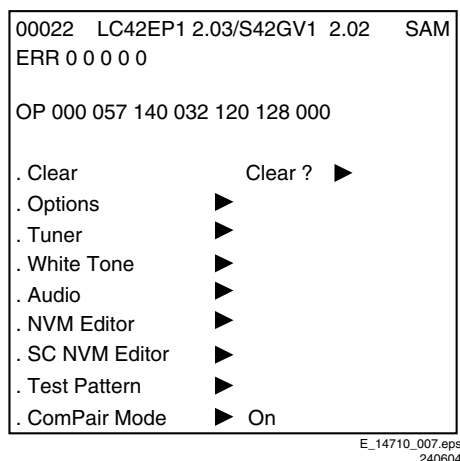


Figure 5-3 SAM menu (example from LC4.2E)

Menu explanation

1. **LLLLL**. This represents the run timer. The run timer counts normal operation hours (including "on/off" switching), but does not count stand-by hours.
2. **AAAABCD-X.YY/EEEEEE_F.GG**. This is the software identification of the Main/Scaler microprocessor:
 - **A**= the chassis name.
 - **B**= the region: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM.
 - **C**= the software diversity:
 - **Europe:** T= 1 pg TXT, F= Full TXT, V= Voice ctrl.
 - **LATAM and NAFTA:** N= Stereo non-dBx, S= Stereo dBx.
 - **Asian Pacific:** T= TXT, N= non-TXT, C= NTSC.
 - **ALL regions:** M= mono, D= DVD, Q= Mk2.
 - **D**= the language cluster number.
 - **X**= the Main software version number (updated with a major change that is incompatible with previous versions).

- **YY**= the sub software version number (updated with a minor change that is compatible with previous versions).
 - **EEEEEE**= the Scaler SW cluster
 - **F**= the Scaler SW version no.
 - **GG**= the sub-version no.
3. **SAM**. Indication of the Service Alignment Mode.
 4. **Error Buffer (ERR)**. Shows all errors detected since the last time the buffer was erased. Five errors possible.
 5. **Option Bytes (OP)**. Shows all option settings. See "Options" in the Alignments section for a detailed description. Seven codes are available.
 6. **Clear**. Erases the contents of the error buffer. Select the CLEAR menu item and press the CURSOR RIGHT key. The content of the error buffer is cleared.
 7. **Options**. Used to set the option bits. See "Options" in the Alignments section for a detailed description.
 8. **Tuner**. Used to align the tuner. See "Tuner" in the Alignments section for a detailed description.
 9. **White Tone**. Used to align the white tone. See "White Tone" in the Alignments section for a detailed description.
 10. **Audio**. No audio alignment is necessary for this television set.
 11. **NVM Editor**. Can be used to change the NVM data in the television set.
 12. **SC NVM Editor. Can be used to edit Scaler NVM.**
 13. **Test Pattern**. For future use.
 14. **ComPair**. Can be used to switch the television to "In System Programming" (ISP) mode, for software uploading via ComPair.
Caution: When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.

How to navigate

- In SAM, select menu items with the CURSOR UP/DOWN keys on the remote control transmitter. The selected item will be highlighted. When not all menu items fit on the screen, use the CURSOR UP/DOWN keys to display the next / previous menu items.
- With the CURSOR LEFT/RIGHT keys, it is possible to:
 - Activate the selected menu item.
 - Change the value of the selected menu item.
 - Activate the selected submenu.
- In SAM, when you press the MENU button twice, the set will switch to the normal user menus (with the SAM mode still active in the background). To return to the SAM menu press the MENU button again.
- When you press the MENU key in while in a submenu, you will return to the previous menu.

How to store SAM settings

To store the settings changed in SAM mode, leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

How to exit

Switch the set to STANDBY by pressing the POWER button on the remote control transmitter or on the television set.

5.2.3 Customer Service Mode (CSM)

Purpose

The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.

The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to enter

To enter CSM, press the following key sequence on the remote control transmitter: "123654" (do not allow the OSD display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:

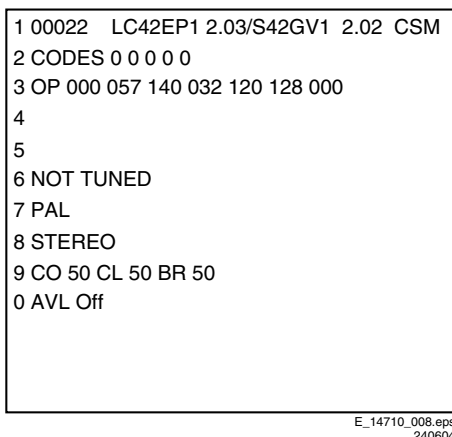


Figure 5-4 CSM menu (example from LC4.2E)

Menu explanation

1. Indication of the decimal value of the operation hours counter, Main/Scaler software version (see "Service Alignment Mode" for an explanation), and service mode (CSM= Customer Service Mode).
2. Displays the last five errors detected in the error code buffer.
3. Displays the option bytes.
4. Displays the type number version of the set (option).
5. Reserved.
6. Indicates the television is receiving an "IDENT" signal on the selected source. If no "IDENT" signal is detected, the display will read "NOT TUNED"
7. Displays the detected Color system (e.g. PAL/NTSC).
8. Displays the detected Audio (e.g. stereo/mono).
9. Displays the picture setting information.
10. Displays the sound setting information.

How to exit

To exit CSM, use one of the following methods:

- Press the MENU, STATUS (or EXIT/INFO/[i+]), or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Problems and Solving Tips Related to CSM

5.3.1 Picture Problems

Note: The problems described below are all related to the TV settings. The procedures used to change the value (or status) of the different settings are described.

Picture too dark or too bright

If:

- The picture improves when you press the AUTO PICTURE button on the remote control transmitter, or
- The picture improves when you enter the Customer Service Mode,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.

2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the CURSOR UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the CURSOR LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the CURSOR UP/DOWN keys (if necessary) to select BRIGHTNESS.
6. Press the CURSOR LEFT/RIGHT keys to increase or decrease the BRIGHTNESS value.
7. Use the CURSOR UP/DOWN keys to select PICTURE.
8. Press the CURSOR LEFT/RIGHT keys to increase or decrease the PICTURE value.
9. Press the MENU button on the remote control transmitter twice to exit the user menu.
10. The new PERSONAL preference values are automatically stored.

White line around picture elements and text

If:

The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the CURSOR UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the CURSOR LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the CURSOR UP/DOWN keys to select SHARPNESS.
6. Press the CURSOR LEFT key to decrease the SHARPNESS value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Snowy picture

Check CSM line 6. If this line reads "Not Tuned", check the following:

- Antenna not connected. Connect the antenna.
- No antenna signal or bad antenna signal. Connect a proper antenna signal.
- The tuner is faulty (in this case line 2, the Error Buffer line, will contain error number 10). Check the tuner and replace/repair the tuner if necessary.

Black and white picture

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the CURSOR UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the CURSOR LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the CURSOR UP/DOWN keys to select COLOR.
6. Press the CURSOR RIGHT key to increase the COLOR value.

7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Menu text not sharp enough

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the CURSOR UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the CURSOR LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the CURSOR UP/DOWN keys to select PICTURE.
6. Press the CURSOR LEFT key to decrease the PICTURE value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (service remote control), which allows faster and more accurate diagnostics. ComPair has three big advantages:

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I²C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I²C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial (or RS-232) cable.

For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in two ways:

- Automatic (by communication with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I²C/UART level. ComPair can access the I²C/UART bus of the television. ComPair can send and receive I²C/UART commands to the micro controller of the television. In this way, it is possible for

ComPair to communicate (read and write) to devices on the I²C/UART busses of the TV-set.

- Manually (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extend. When this is not the case, ComPair will guide you through the fault finding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the fault finding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Beside fault finding, ComPair provides some **additional features** like:

- Up- or downloading of pre-sets.
- Managing of pre-set lists.
- Emulation of the (European) Dealer Service Tool (DST).
- If both ComPair and Force/SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink.

Example: *Measure the DC-voltage on capacitor C2568 (Schematic/Panel) at the Mono-carrier.*

- Click on the "Panel" hyperlink to automatically show the PWB with a highlighted capacitor C2568.
- Click on the "Schematic" hyperlink to automatically show the position of the highlighted capacitor.

5.4.3 How To Connect

This is described in the chassis fault finding database in ComPair .

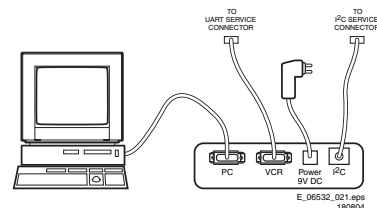


Figure 5-5 ComPair interface connection

5.4.4 How To Order

ComPair order codes (US):

- ComPair Software: ST4191.
- ComPair Interface Box: 4822 727 21631.
- AC Adapter: T405-ND.
- ComPair Quick Start Guide: ST4190.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630

Note: If you encounter any problems, contact your local support desk.

5.5 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

5.5.1 How To Read The Error Buffer

You can read the error buffer in 3 ways:

- On screen via the SAM (if you have a picture).
Examples:
 - ERROR: 0 0 0 0 0: No errors detected
 - ERROR: 6 0 0 0 0: Error code 6 is the last and only detected error
 - ERROR: 9 6 0 0 0: Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See "The Blinking LED Procedure".
- Via ComPair.

5.5.2 How To Clear The Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:
 - To enter SAM, press the following key sequence on the remote control transmitter: "062596" directly followed by the OSD/STATUS button (do not allow the OSD display to time out between entries while keying the sequence).
 - Make sure the menu item CLEAR is highlighted. Use the CURSOR UP/DOWN buttons, if necessary.
 - Press the CURSOR RIGHT button to clear the error buffer. The text on the right side of the "CLEAR" line will change from "CLEAR?" to "CLEARED"
- If an error does not reoccur within 50 hours it is deleted from the error buffer.

5.5.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.

If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-2 Error code overview

Error	Device	Error description	Check item	Diagram
0	Not applicable	-	-	-
1	Not applicable	-	-	-
2	Not applicable	-	-	-
3	Not applicable	-	-	-
4	GM1501 Scaler Flash-ROM	I ² C error while communicating with the Genesis Scaler and/or Flash-ROM is faulty/empty	7401 7530	A7 A11
5	Not applicable	+5V protection	7930	A6
6	I ² C bus	General I ² C error	7011, 3088, 3096	A2
7	Not applicable	-	-	-
8	M24C32	I ² C error while communicating with the Scaler EEPROM	7531	A11
9	M24C16	I ² C error while communicating with the EEPROM	7099	A2
10	Tuner	I ² C error while communicating with the PLL tuner	1302, 3302, 3303, 3327	A1
11	Not applicable	-	-	-
12	Not applicable	-	-	-
13	Not applicable	-	-	-
14	K4D263238M	Read-write error with the Scaler SDRAM	7501	A10
15	TDA9178T/N1	I ² C error while communicating with Histogram	7560	A3
16	TDA9178T/N1	I ² C error while communicating with EPLD on Pixel Plus panel	7560	A3

5.6 The Blinking LED Procedure

Using this procedure, you can make the contents of the error buffer visible via the front LED. This is especially useful when there is no picture.

When the SDM is entered, the front LED will blink the contents of the error-buffer:

- The LED blinks with as many pulses as the error code number, followed by a time period of 1.5 seconds, in which the LED is "off".
- Then this sequence is repeated.

Any RC5 command terminates this sequence.

Example of error buffer: 12 9 6 0 0

After entering SDM, the following occurs:

- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again at 12 short blinks.

5.7 Fault Finding and Repair Tips

Notes:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be handy if one directly can change the NVM contents. This can be done with the "NVM Editor" in SAM mode. With this option, single bytes can be changed.

Table 5-3 NVM editor overview

	Hex	Dec	Description
.ADR	0x000A	10	Existing value
.VAL	0x0000	0	New value
.Store	Store ?		

5.7.2 Load default NVM values

In case a blank NVM is placed or when the NVM content is corrupted, default values can be downloaded into the NVM. After the default values are downloaded it will be possible to start up and to start aligning the TV set. This is no longer initiated automatically; to initiate the download the following action has to be performed:

1. Switch "off" the TV set via the AC Power switch.
2. Short circuit the SDM jumpers (keep short-circuited).
3. Press P+ or Ch+ on the local keyboard (and keep it pressed).
4. Switch on the TV set via the AC Power switch.
5. When the set has started, the P+/Ch+ button can be released and the short circuit of the SDM jumpers can be removed.
6. The red LED will be on continuously to indicate that the download is initiated (normally when SDM is activated the red LED will start with the Blinking LED sequence).
7. Wait +/- 30 s (time needed to download default values to the NVM).

5.7.3 Tuner and IF

No Picture in RF mode

1. Check whether picture is present in AV. If not, go to Video processing troubleshooting section.
2. If present, check that the Option settings are correct.
3. Check that all supply voltages are present.
4. Check if I²C lines are working correctly (3.3V).
5. Manually store a known channel and check if there is IF output at Tuner pin 11.
6. Feed in 105 dBuV at Tuner pin 11 and check whether there is RGB output from Video Processing IC. If yes, Tuner may be defect. Replace Tuner.

Required system is not selected correctly

1. Check whether a Service jumper (#4022, 0805 size) is present. If yes, remove it.

5.7.4 Video Processing

No power

1. Check +12 V and 3V3 at position 1910.
2. If no supply, check the connector 1910.
3. If it is correct, check the power supply board.

Power supply is correct but no green LED

1. Check if connectors 1005 and 1601 are properly inserted.
2. If yes, check if the 3V3 is present.

No picture display

1. Check the RGB signal.
2. If it is present, check 3-IC7016 (NE555).
3. If it has output, the problem is in SCALER part.
4. Otherwise, check H-out on pin 2 of NE555. If the input signal of pin2 is present, but no output, the IC is defect.

Note:

- If the H-out (pin 67) doesn't have signal or the level is low, check the output of NE555 (pin 3) during start up.
- If the H-out (pin 67) has a signal (or has a signal for a very short time), change IC7016 (NE555).

No TV but PC is present

1. Check if HSYNC and VSYNC are present at pin 3 of 7017 and 7015.
2. If they are present, check RGB output.
3. If there is no RGB output, the IC TDA120xx can be defect.

Comb Filter not working

Check Option Byte 5 in SAM (see also chapter 8 "Alignments").

5.7.5 Power Supply

This power supply contains two fuses. One is near the AC Power (mains) inlet connector 1308 and the other is near connector 1307.

1. Check with power supply in "off" state by means of ohmic measurement.
2. Fuse 1400 may open in case of severe lightning strikes and/or failures in the power supply.
3. Fuses 1401 may open in case of a problem with the Standby Supply. Replacement of the fuse is needed, but not before the cause of the overload conditions is resolved.

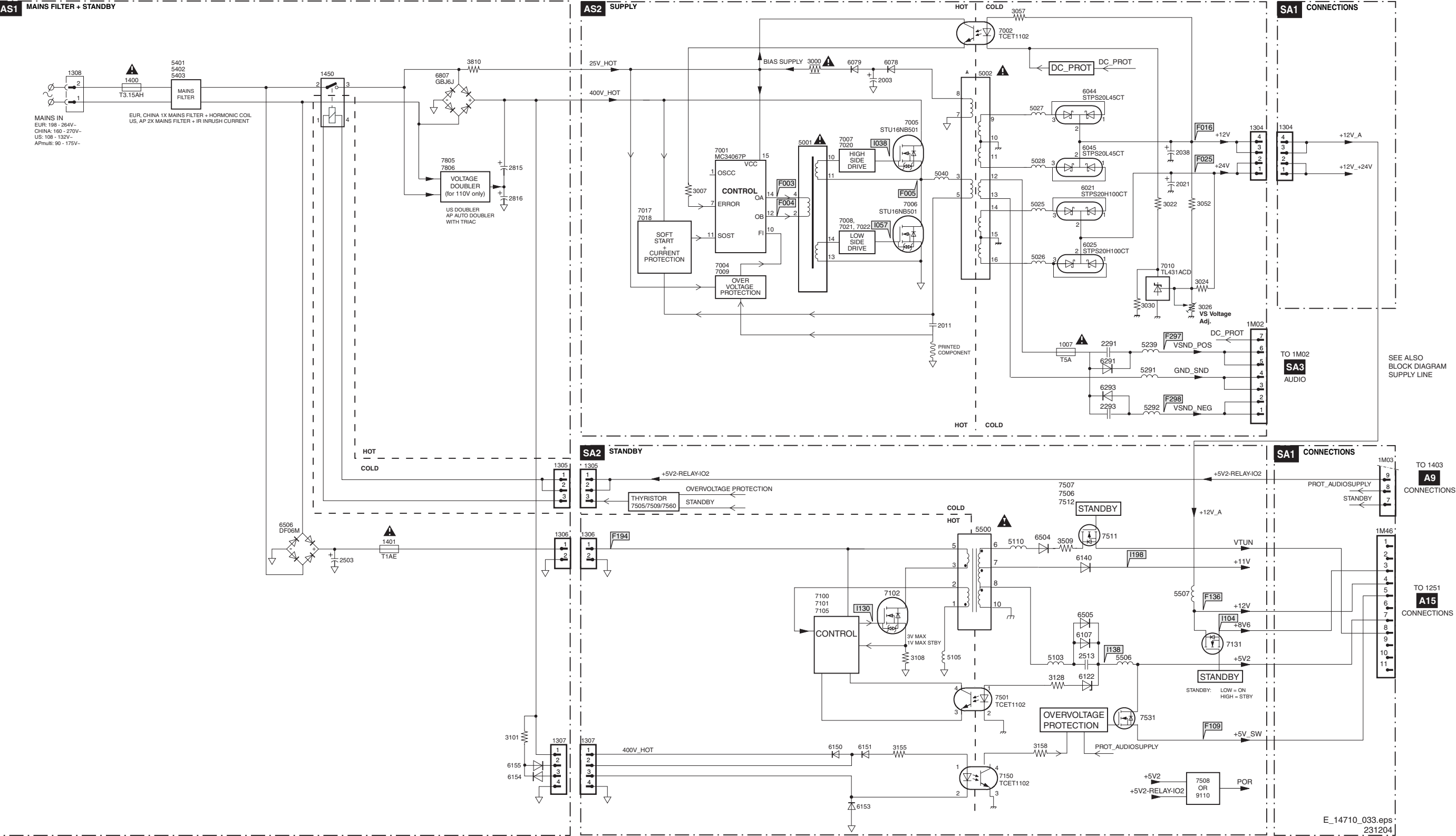
Block Diagram Supply and Standby

SUPPLY + STANDBY

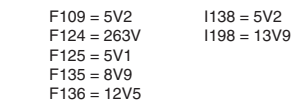
AS1 MAINS FILTER + STANDBY

AS2 SUPPLY

SA1 CONNECTIONS



SA



3104 313 6010.4

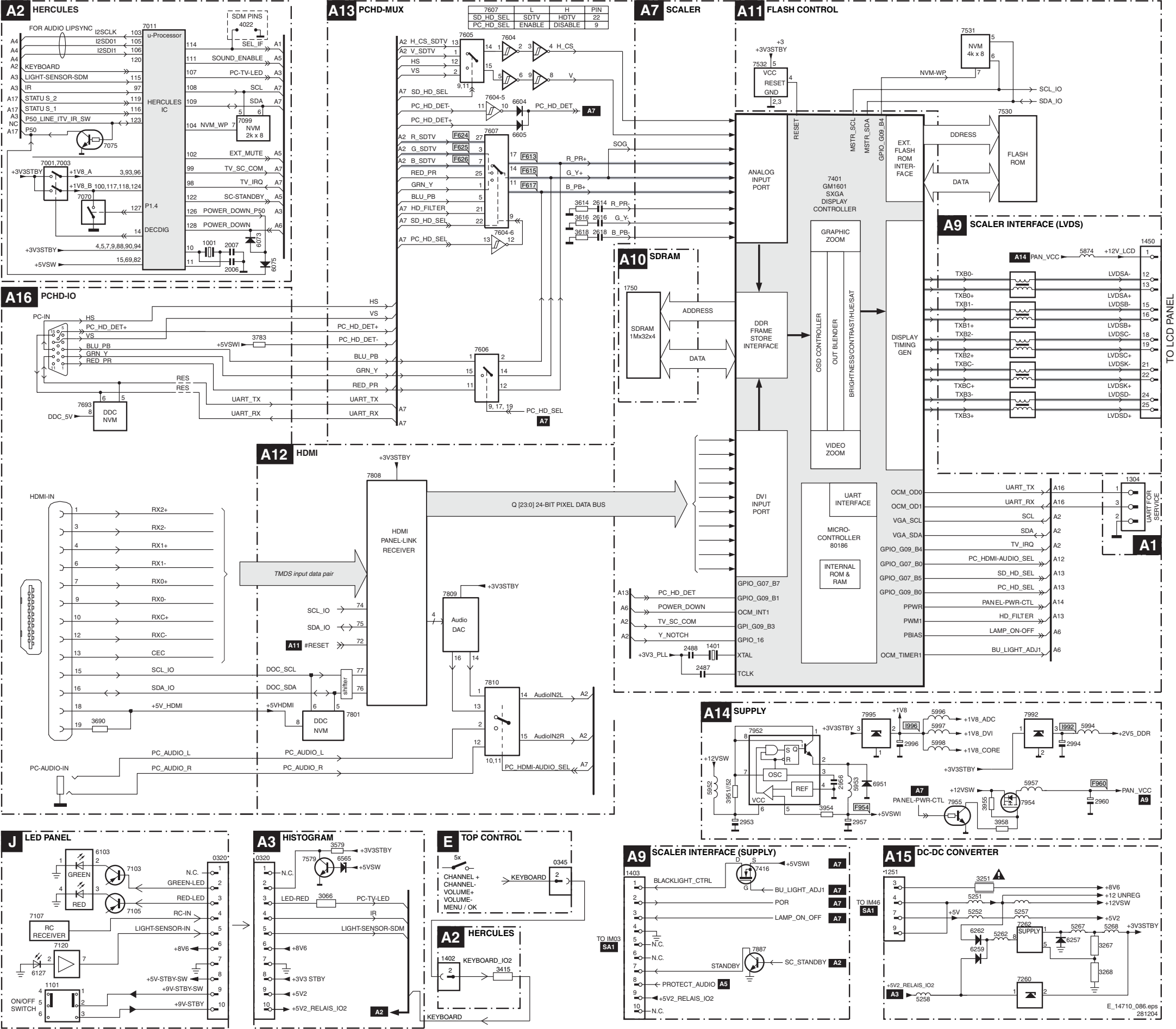


[3104 313 6009.4

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271204

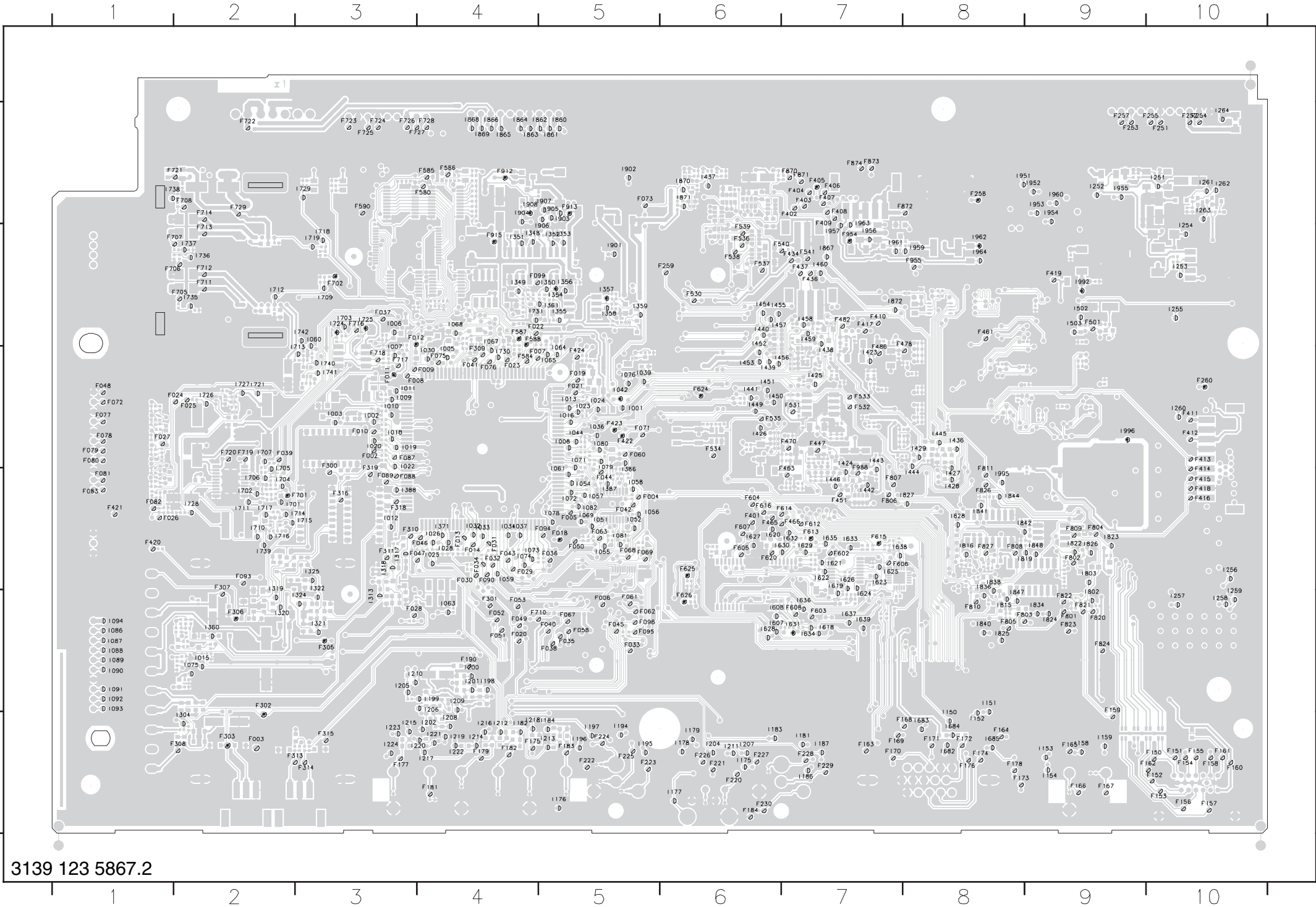
E_14710_084.eps
281204

Block Diagram Scaler and Supply

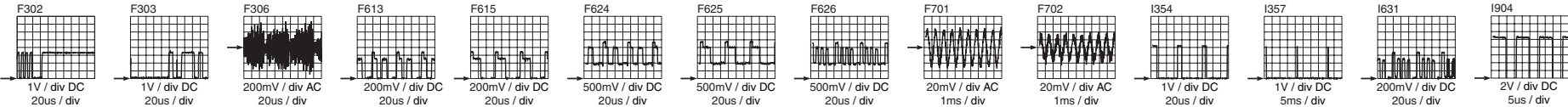


Testpoint Overview SSB (Top Side)

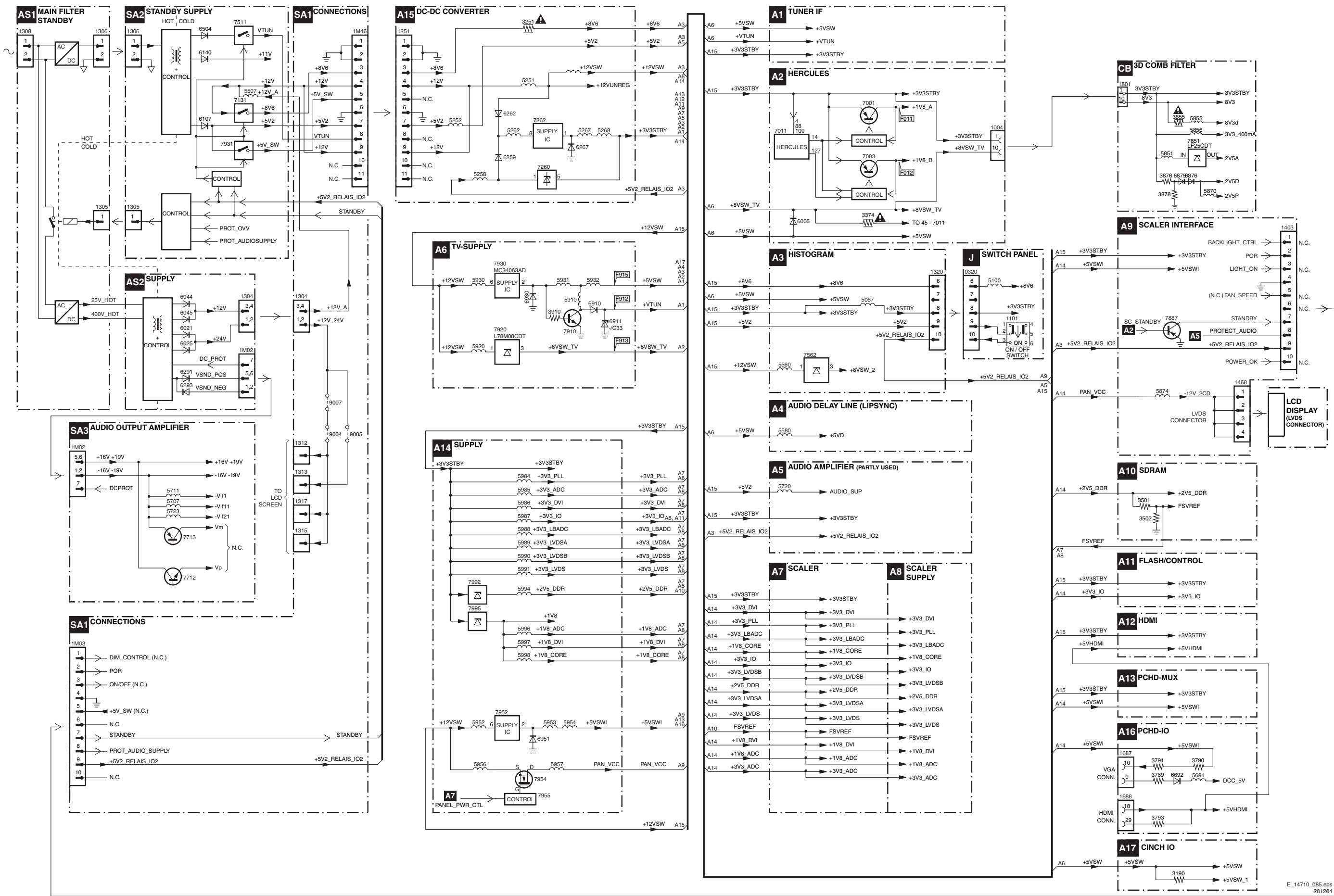
F002 C3	F014 D4	F029 D4	F041 C4	F053 E4	F075 C4	F090 D4	F156 F10	F168 F8	F181 F4	F227 F6	F260 C10	F311 D3	F406 A7	F418 D10	F461 B8	F533 C7	F586 A4	F613 D7	F707 B2	F721 A2	I059 D4	I251 A10	I619 D7	I842 D8
F003 F2	F018 D5	F030 D4	F042 D5	F058 E5	F076 C4	F093 D2	F157 F10	F169 F7	F182 F4	F228 F7	F300 C3	F313 F2	F407 A7	F419 B9	F463 D7	F534 C6	F587 B4	F614 D7	F708 A2	F722 A2	I060 B3	I252 A9	I620 D6	I844 D8
F004 D5	F019 C5	F031 D4	F043 D4	F060 C5	F077 C1	F094 D5	F158 F10	F170 F7	F183 F5	F229 F7	F301 E4	F314 F3	F408 A7	F420 D1	F465 D6	F535 C6	F588 B4	F615 D7	F710 E5	F723 A3	I061 D5	I253 B10	I621 D7	I847 E8
F005 D5	F020 E4	F032 D4	F044 D5	F061 E5	F078 C1	F095 E5	F159 E9	F171 F8	F184 F6	F230 F6	F302 E2	F315 F3	F409 A7	F421 D1	F466 D7	F536 B6	F590 A3	F616 D6	F711 B2	F724 A3	I063 E4	I254 B10	I622 D7	I848 D9
F006 E5	F021 C5	F033 E5	F045 E5	F062 E5	F079 C1	F096 E5	F160 F10	F172 F8	F190 E4	F251 A10	F303 F2	F316 D3	F410 B7	F422 C5	F470 C7	F537 B6	F602 D7	F620 D6	F712 B2	F725 A3	I064 C5	I255 B10	I623 D7	I860 A5
F007 C4	F022 B4	F034 D4	F046 D4	F063 D5	F080 C1	F099 B4	F161 F10	F173 F8	F220 F6	F252 A10	F305 E3	F318 D3	F411 C10	F423 C5	F478 B8	F538 B6	F603 E7	F624 C6	F713 B2	F726 A3	I065 C5	I256 D10	I624 E7	I861 A5
F008 C3	F023 C4	F035 E5	F047 D4	F067 E5	F081 D1	F150 F10	F162 F10	F174 F8	F221 F6	F253 A9	F306 E2	F319 C3	F412 C10	F424 C5	F482 B7	F539 B6	F604 D6	F625 D6	F714 A2	F727 A4	I067 B4	I257 E10	I625 D7	I862 A5
F009 C4	F024 C2	F036 D5	F048 C1	F068 D5	F082 D1	F151 F10	F163 F7	F175 F4	F222 F5	F254 A10	F306 E2	F401 D6	F413 C10	F434 B7	F486 C7	F540 B7	F605 D6	F626 E6	F716 B3	F728 A4	I068 B4	I258 E10	I626 D7	I863 A4
F010 C3	F025 C2	F037 B3	F049 E4	F069 D5	F083 D1	F152 F10	F164 F8	F176 F8	F223 F5	F255 A10	F307 D2	F402 A7	F414 D10	F436 B7	F501 B9	F541 B7	F606 D7	F701 D3	F717 C3	F729 A2	I069 D5	I259 E10	I627 D6	I864 A4
F011 C3	F026 D1	F038 E5	F050 D5	F071 C5	F087 C3	F153 F10	F165 F9	F177 F3	F224 F5	F257 A9	F308 F2	F403 A7	F415 D10	F437 B7	F530 B6	F580 A4	F607 D6	F702 B3	F718 C3	F801 E9	I071 C5	I260 C10	I628 E6	I865 A4
F012 B3	F027 C1	F039 C2	F051 E4	F072 C1	F088 D3	F154 F10	F166 F9	F178 F8	F225 F5	F258 A8	F309 C4	F404 A7	F416 D10	F447 C7	F531 C7	F584 C4	F608 E7	F705 B2	F719 C2	F802 D9	I072 D5	I261 A10	I629 D7	I866 A4
F013 D4	F028 E3	F040 E5	F052 E4	F073 A5	F089 D3	F155 F10	F167 F9	F179 F4	F226 F6	F259 B6	F310 D3	F405 A7	F417 B7	F451 D7	F532 C7	F585 A4	F612 D7	F706 B1	F720 C2	F803 E9	I073 D4	I262 A10	I630 D7	I867 B7



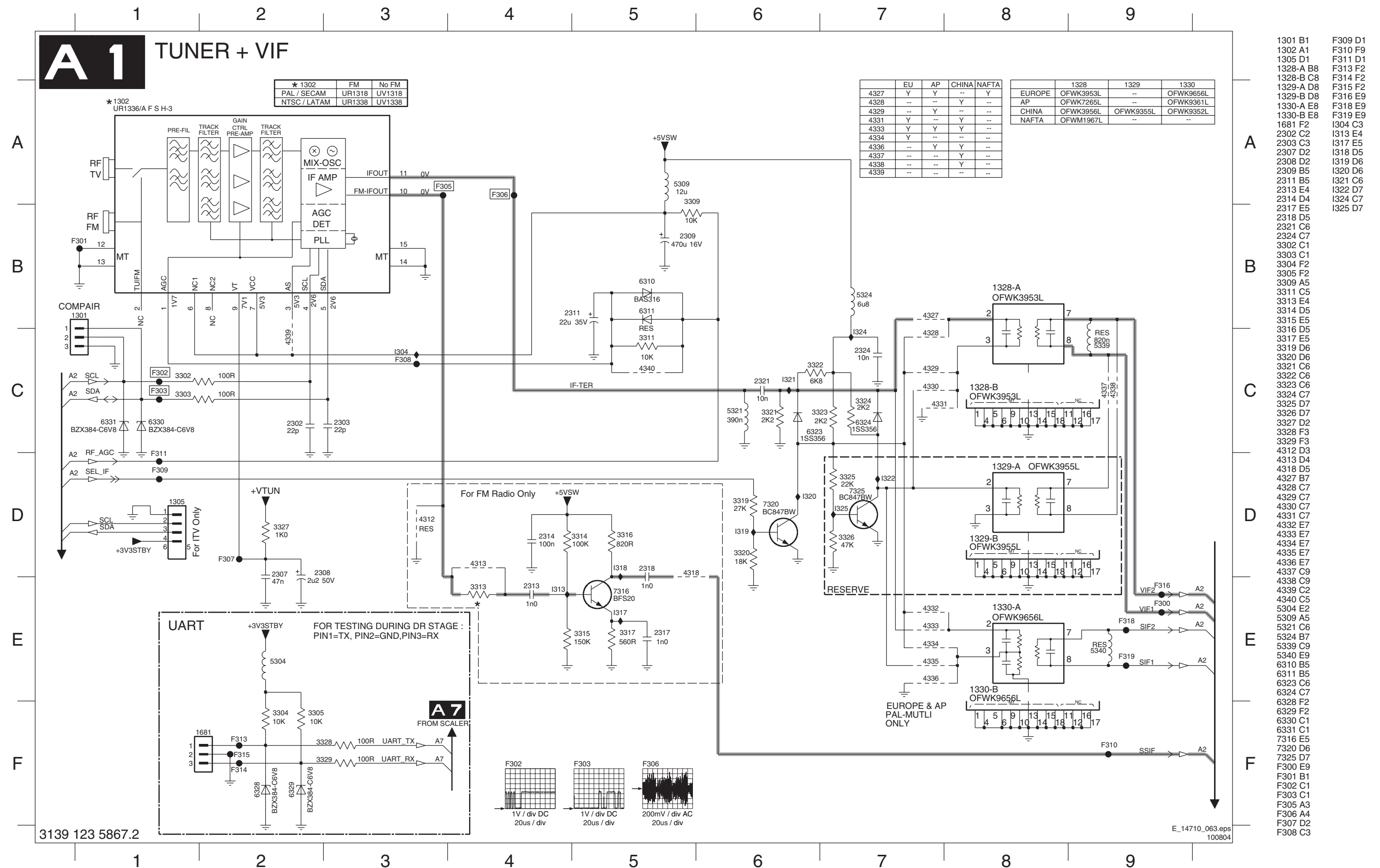
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I063 E4	I254 B10	I622 D7	I848 D9
I064 C5	I255 B10	I623 D7	I860 A5
I065 C5	I256 D10	I624 E7	I861 A5
I067 B4	I257 E10	I625 D7	I862 A5
I068 B4	I258 E10	I626 D7	I863 A4
I069 D5	I259 E10	I627 D6	I864 A4
I071 C5	I260 C10	I628 E6	I865 A4
I072 D5	I261 A10	I629 D7	I866 A4
I073 D4	I262 A10	I630 D7	I867 B7
I074 D4	I263 A10	I631 E7	I868 A4
I075 E2	I264 A10	I632 D7	I869 A4
I076 C5	I304 F2	I633 D7	I870 A6
I078 D5	I313 E3	I634 E7	I871 A6
I079 C5	I317 D3	I635 D7	I872 B7
I080 C5	I318 D3	I636 E7	I901 B5
I081 D5	I319 D2	I637 E7	I902 A5
I082 D5	I320 E2	I638 D7	I903 A5
I086 E1	I321 E3	I639 E7	I904 A4
I087 E1	I322 D3	I682 F8	I905 A5
I088 E1	I324 E3	I683 F8	I906 B5
I089 E1	I325 D3	I684 F8	I907 A5
I090 E1	I348 B4	I685 F8	I908 A4
I091 E1	I349 B4	I701 D2	I951 A8
I092 E1	I350 B5	I702 D2	I952 A9
I093 E1	I351 B4	I703 B3	I953 A9
I094 E1	I352 B5	I704 D2	I954 A9
I150 F8	I353 B5	I705 D2	I955 A9
I151 E8	I354 B5	I706 D2	I956 B7
I152 F8	I355 B5	I707 C2	I957 B7
I153 F9	I356 B5	I709 B3	I959 B8
I154 F9	I357 B5	I710 D2	I960 A9
I158 F9	I358 B5	I711 D2	I961 B7
I159 F9	I359 B5	I712 B2	I962 B8
I175 F6	I360 E2	I713 C3	I963 A7
I176 F5	I361 B5	I714 D3	I964 B8
I177 F6	I371 D4	I715 D3	I992 B9
I178 F6	I386 D5	I716 D2	I995 D8
I179 F6	I387 D5	I717 D2	I996 C9
I181 F7	I388 D3	I718 B3	
I182 F4	I423 C7	I719 B3	
I183 F6	I424 C7	I721 C2	
I184 F5	I425 C7	I724 B3	
I186 F7	I426 C6	I725 B3	
I187 F7	I427 D8	I726 C2	
I194 F5	I428 D8	I727 C2	
I195 F5	I429 C8	I728 D2	
I196 F5	I436 C8	I729 A3	
I197 F5	I437 A6	I730 C4	
I198 E4	I438 C7	I731 B4	
I199 E4	I439 C6	I735 B2	
I200 E4	I440 B6	I736 B2	
I201 E4	I441 C6	I737 B2	
I202 F4	I442 D7	I738 A1	
I204 F6	I443 C7	I739 D2	
I205 E3	I444 D8	I740 C3	
I206 E4	I445 C8	I741 C3	
I207 F6	I446 D7	I742 B3	
I208 F4	I449 C6	I802 E9	
I209 E4	I450 C6	I803 D9	
I210 E3	I451 C6	I815 E8	
I211 F6	I452 B6	I816 D8	
I212 F4	I453 C6	I819 D9	
I213 F5	I454 B6	I822 D9	
I214 F4	I455 B6	I823 D9	
I215 F3	I456 C7	I824 E9	
I216 F4	I457 B6	I825 E8	
I217 F4	I458 B7	I826 D9	
I218 F4	I459 B7	I827 D8	
I219 F4	I460 B7	I828 D8	
I220 F4	I502 B9	I834 E9	
I221 F4	I503 B9	I836 D8	
I222 F4	I607 E6	I838 D8	
I223 F3	I608 E6	I840 E8	
I224 F3	I618 E7	I841 D8	



Supply Voltage Overview



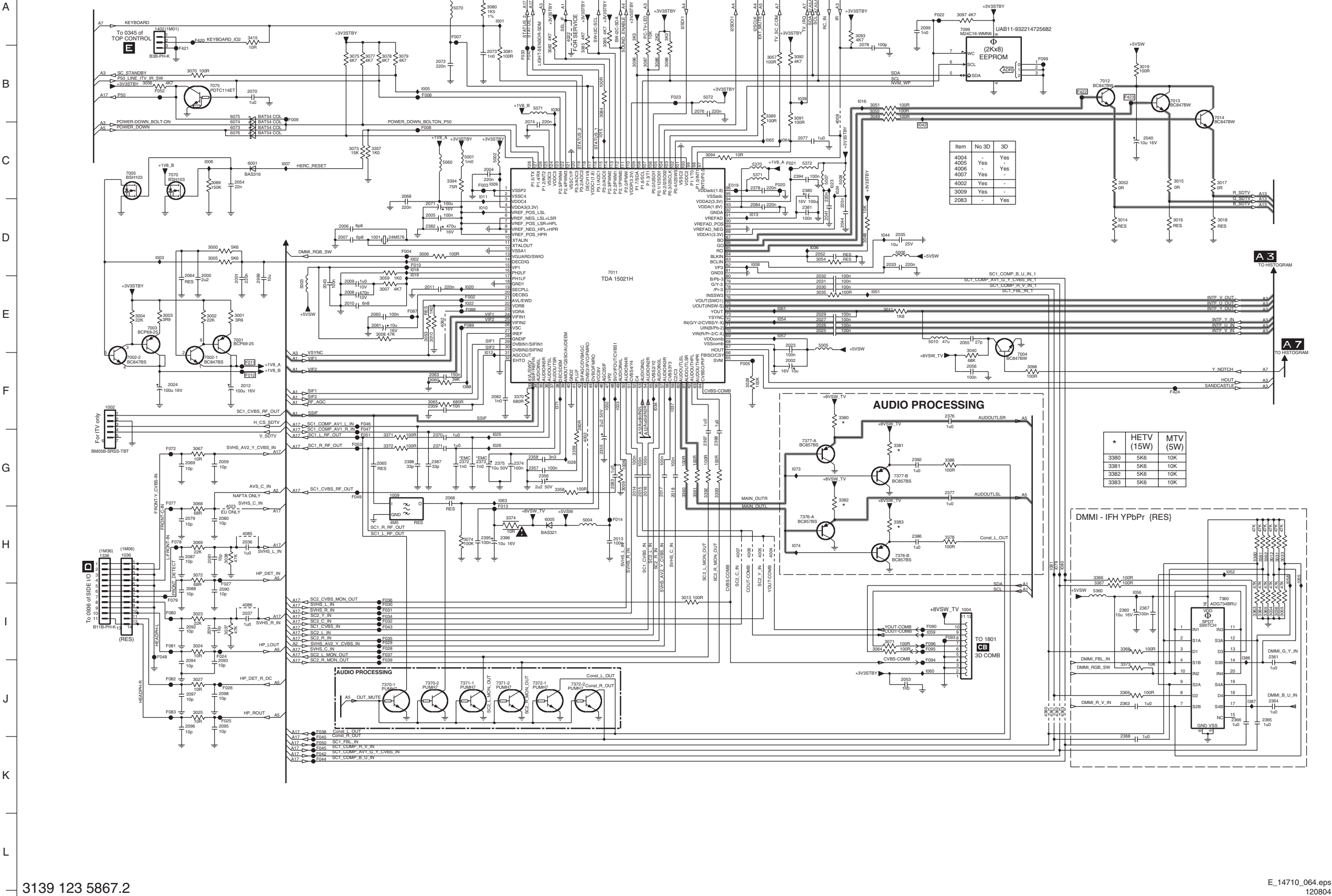
A1 TUNER + VIF



SSB: Histogram and Hercules

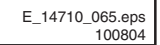
A2

HISTOGRAM & HERCULES



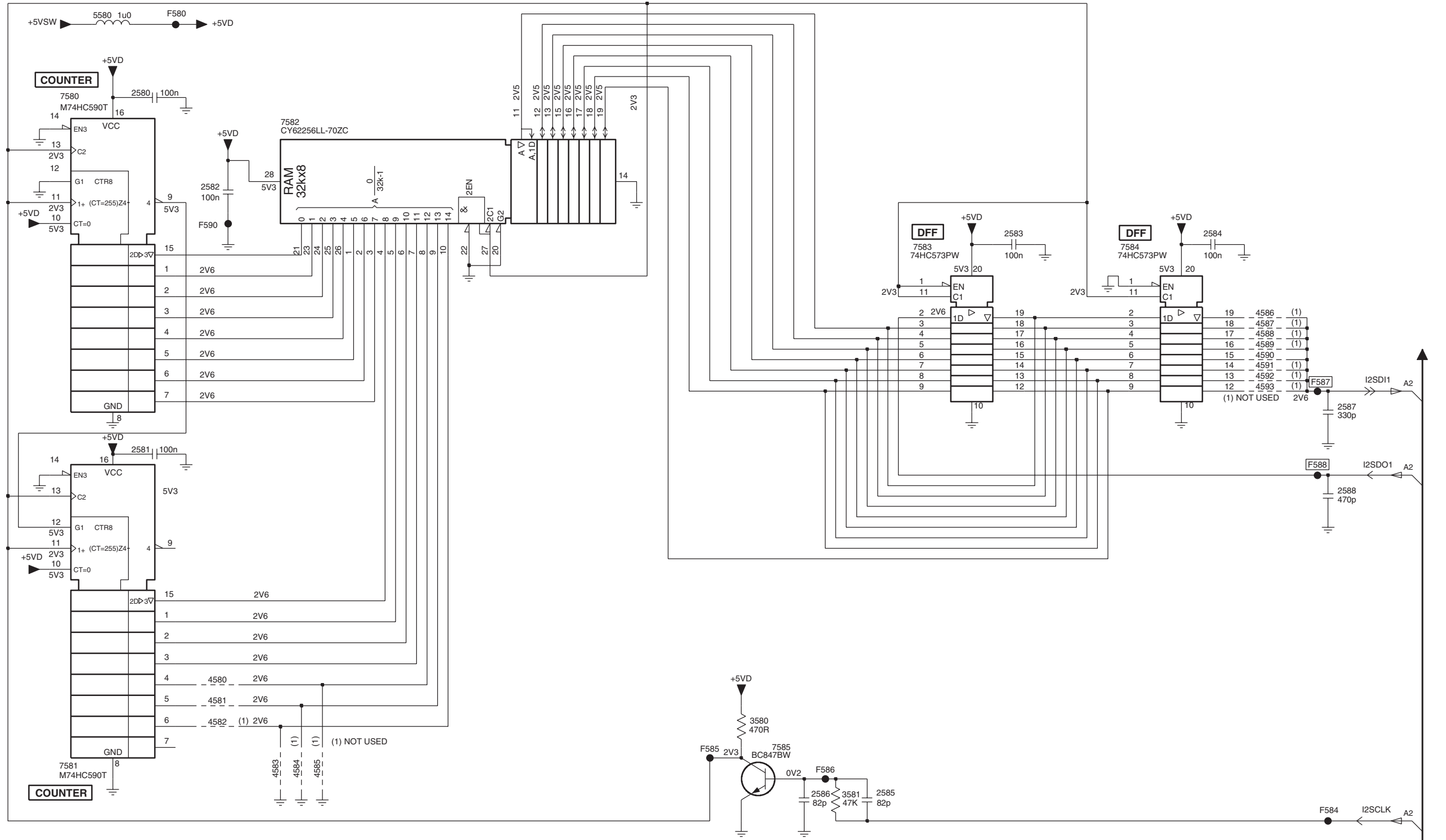
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1002 F2	3069 H3	F051 G5
1004 I13	3070 B3	F052 B2
1009 G5	3071 I12	F053 G5
1036 H2	3072 H3	F072 G2
1336 H2	3073 C5	F077 G2
1402 A2	3074 H6	F078 H3
2000 D3	3075 B5	F079 I2
2001 E3	3077 B5	F080 I2
2002 F10	3078 B5	F081 I2
2004 C7	3079 B5	F082 J2
2005 D6	3080 A7	F083 J2
2006 D5	3081 B7	F087 E6
2007 D5	3082 B7	F088 E6
2008 E5	3083 B8	F089 E6
2009 E5	3084 B8	F090 I12
2010 E5	3085 A8	F091 I13
2011 E6	3086 B9	F094 J12
2012 F3	3087 B9	F095 I12
2013 H8	3088 B9	F096 I12
2014 G8	3089 C3	F099 B14
2015 G9	3091 B11	F420 A3
2016 G9	3092 B11	F421 B3
2017 G9	3093 A11	F422 B14
2018 G9	3094 C9	F423 B15
2023 E10	3096 B8	F424 F15
2024 F2	3097 A13	I001 A7
2025 E11	3098 F14	I002 D6
2026 E11	3357 C5	I003 D2
2027 E11	3358 G7	I005 B6
2029 E11	3359 G8	I006 C3
2030 E11	3360 H17	I007 C4
2031 E11	3361 H17	I008 D10
2032 E11	3362 H17	I009 C7
2033 D12	3363 I17	I010 D6
2035 D12	3364 I17	I011 C8
2036 H3	3365 I17	I012 F7
2037 I3	3366 H15	I013 D10
2038 E4	3367 J15	I015 C8
2040 C15	3368 I15	I016 B11
2041 D11	3369 J15	I018 D6
2043 E4	3370 F7	I019 D6
2044 D11	3371 G5	I020 E6
2052 D11	3372 G5	I022 E6
2053 I12	3373 J15	I023 C11
2054 C3	3374 H7	I024 C11
2055 E13	3378 H13	I025 G7
2056 F13	3380 F11	I026 G7
2059 G3	3381 G12	I028 G8
2060 E5	3382 G11	I030 B7
2061 E5	3383 H12	I032 F8
2063 F6	3386 G13	I033 F8
2064 D3	3389 E10	I034 F9
2065 G6	3390 G9	I036 D11
2066 G6	3391 G9	I037 F9
2068 C5	3392 G9	I039 B11
2069 G3	3393 G10	I042 C12
2070 B3	3394 C6	I044 D12
2071 D6	3415 A3	I051 E12
2072 B6	4002 G8	I052 H16
2073 B7	4004 H10	I054 I10
2074 C7	4005 H10	I055 H17
2076 B9	4006 H10	I056 I15
2077 C11	4007 H10	I057 E10
2078 B11	4008 H11	I058 H17
2079 H3	4022 A8	I059 I12
2080 H3	4023 H3	I060 J12
2081 H3	4062 E6	I081 E10
2082 F7	4085 H3	I063 G7
2083 G8	4086 G3	I064 C10
2084 D10	4088 J14	I065 C10
2087 H3	4361 J14	I073 G11
2088 I3	4362 J14	I074 H11
2090 I3	4363 J14	I079 H14
2091 I3	5001 C6	I080 H14
2092 I3	5002 C7	I081 H14
2093 J3	5003 E4	I371 F7
2094 J3	5004 H8	I386 I16
2095 J3	5005 E11	I387 J16
2096 J3	5006 D12	I388 F6
2097 J3	5007 C11	
2098 J3	5008 C11	
2099 A12	5010 E12	
2355 G8	5060 C6	
2356 G7	5070 A6	
2357 G7	5071 B7	
2358 G7	5072 B9	
2359 F6	5360 I14	
2360 I15	5370 C10	
2361 I17	5371 C10	
2363 J15	5372 C11	
2364 J17	6001 C3	
2365 J17	6005 C7	
2366 J16	6073 C3	
2367 I15	6074 C3	
2368 K15	6075 B3	
2370 G6	6076 C3	
2371 G6	7001 E3	
2372 G6	7002-2 F2	
2373 G6	7002-2 F2	
2374 G7	7004 F14	
2375 G7	7005 C2	
2376 F13	7011 D8	
2377 G13	7012 B15	
2378 C10	7013 B15	
2380 C11	7014 B16	
2381 D11	7015 B16	
2382 D6	7070 C3	
2386 H12	7073 B3	
2387 G6	7099 A13	
2388 G6	7360 I16	
2392 G12	7370-1 J5	
2394 C11	7370-2 J6	
2395 H7	7371-1 J6	
2396 H7	7371-2 J7	
2397 G8	7372-1 J7	
2398 G10	7372-2 J8	
3000 D3	7376-A H11	
3001 E3	7376-B H12	
3002 E3	7377-A G12	
3003 E2	7377-B G12	
3004 E2	F002 E6	
3005 D3	F003 C6	
3006 D6	F004 D5	
3007 E5	F005 F10	
3008 E5	F006 B6	
3009 G8	F007 A6	
3010 E6	F008 C6	
3011 E12	F009 B4	
3012 H17	F010 D6	
3013 B9	F011 F3	
3014 D15	F012 F3	
3015 C16	F013 H7	
3016 D16	F014 H8	
3017 C16	F019 C10	
3018 D16	F020 C10	
3019 B15	F021 C11	
3023 I3	F022 A12	
3024 I3	F023 B9	
3025 J3	F024 I3	
3027 J3	F025 J3	
3028 F10	F026 J3	
3031 H17	F027 I3	
3033 H17	F028 I5	
3034 I17	F029 I5	
3035 E11	F030 I5	
3036 I17	F031 I5	
3037 I3	F032 I5	
3038 H3	F033 B7	
3040 E13	F034 I5	
3048 D11	F035 I5	
3049 B12	F036 I5	
3050 B12	F037 I5	
3051 B12	F038 J4	
3052 C15	F039 J5	
3053 E6	F040 K4	
3054 D11	F041 B7	
3055 I17	F042 K4	
3056 B2	F043 I5	
3057 B10	F044 K4	
3058 E5	F045 K4	
3060 F6	F046 F5	
3064 I12	F047 G5	
3065 F9	F048 I2	
3067 G3	F049 G5	

A3 HISTOGRAM & HERCULES



SSB: Audio Delay line (Lipsync)

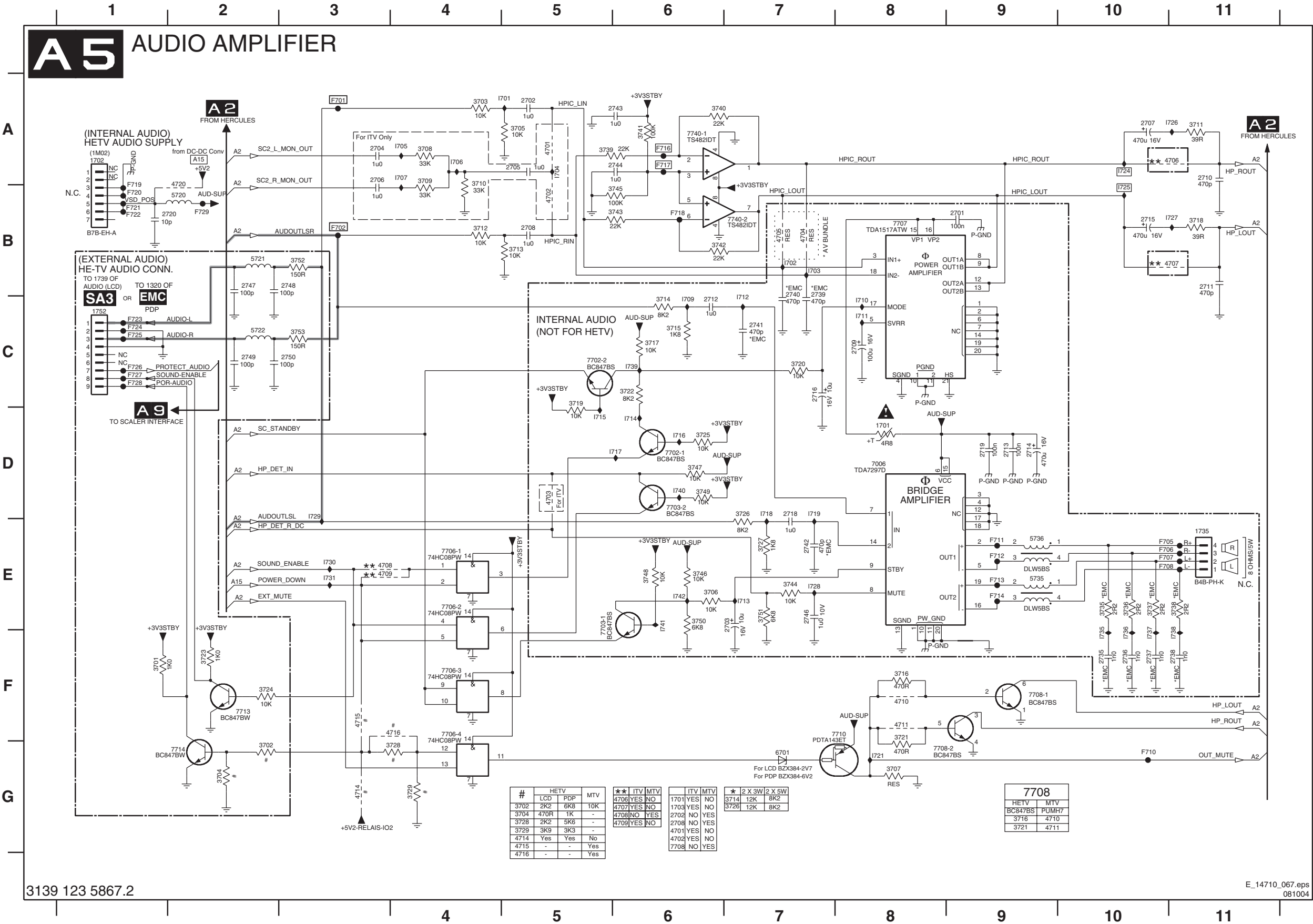
A4 AUDIO DELAY LINE (LIPSYNC)



- 2580 A1
- 2581 C1
- 2582 A2
- 2583 B7
- 2584 B8
- 2585 E6
- 2586 E6
- 2587 C9
- 2588 C9
- 3580 E5
- 3581 E6
- 4580 E2
- 4581 E2
- 4582 E2
- 4583 E2
- 4584 E2
- 4585 E2
- 4586 B9
- 4587 B9
- 4588 B9
- 4589 B9
- 4590 C9
- 4591 C9
- 4592 C9
- 4593 C9
- 5580 A1
- 7580 A1
- 7581 E1
- 7582 A2
- 7583 B6
- 7584 B8
- 7585 E5
- F580 A1
- F584 E9
- F585 E5
- F586 E6
- F587 C9
- F588 C9
- F590 B2

SSB: Audio Amplifier

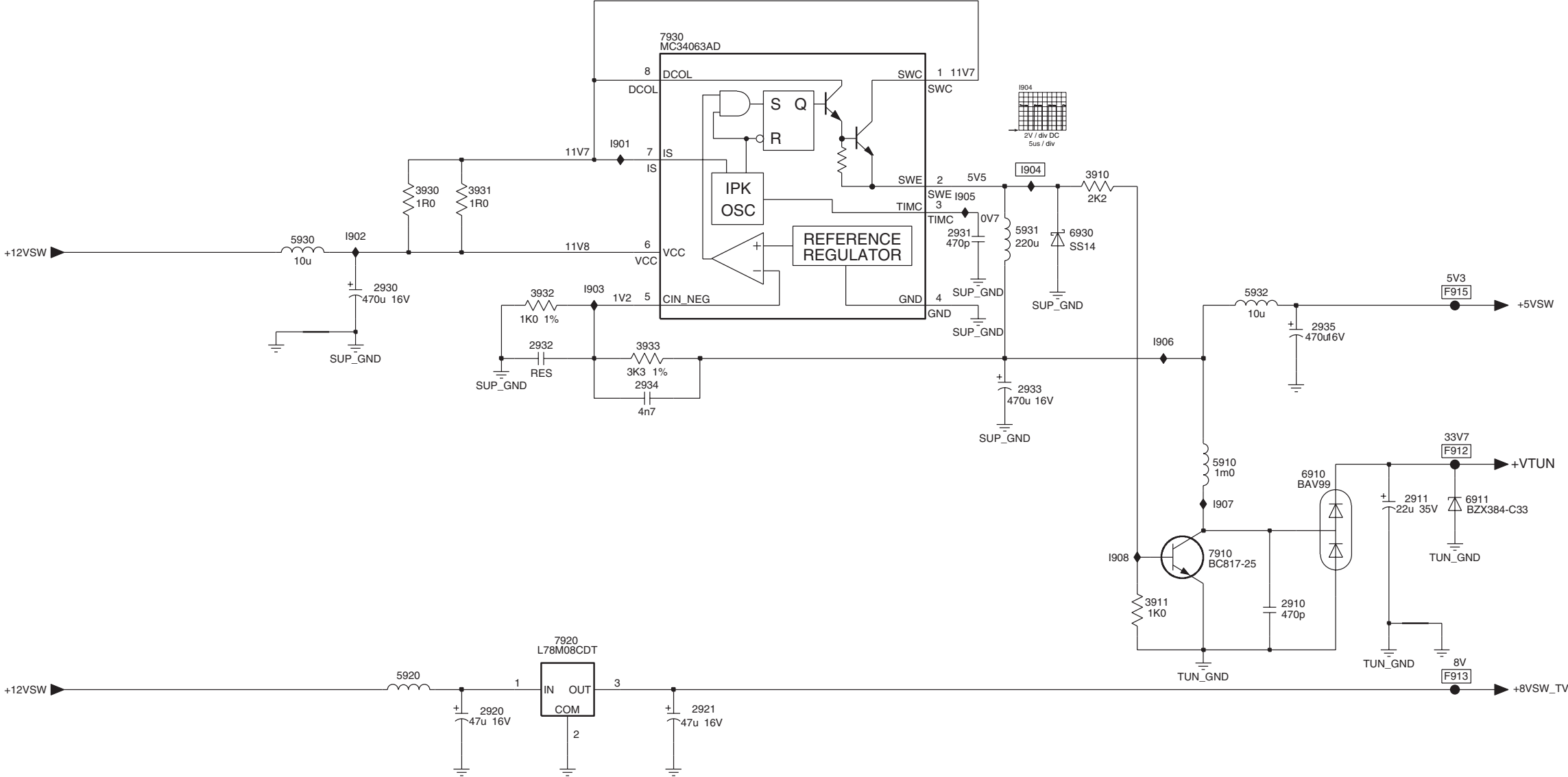
A5 AUDIO AMPLIFIER



- 1701 D8
- 1702 A1
- 1735 E11
- 1752 C1
- 2701 B9
- 2702 A5
- 2703 E7
- 2704 A3
- 2705 A5
- 2706 A3
- 2707 A10
- 2708 B5
- 2709 C8
- 2710 A11
- 2711 B11
- 2712 C6
- 2713 D9
- 2714 D9
- 2715 B10
- 2716 C7
- 2718 D7
- 2719 D9
- 2720 B2
- 2735 F10
- 2736 F10
- 2737 F10
- 2738 F11
- 2739 B7
- 2740 B7
- 2741 C7
- 2742 E7
- 2743 A6
- 2744 A6
- 2746 E7
- 2747 B2
- 2748 B3
- 2749 C2
- 2750 C3
- 3701 F1
- 3702 G2
- 3703 A4
- 3704 G2
- 3705 A5
- 3706 E6
- 3707 G8
- 3708 A4
- 3709 A4
- 3710 A4
- 3711 A11
- 3712 B4
- 3713 B5
- 3714 C6
- 3715 C6
- 3716 F8
- 3717 C6
- 3718 B11
- 3719 C5
- 3720 C7
- 3721 F8
- 3722 C6
- 3723 F2
- 3724 F2
- 3725 D6
- 3726 D7
- 3727 E7
- 3728 G4
- 3729 G4
- 3735 E10
- 3736 E10
- 3737 E10
- 3738 E11
- 3739 A5
- 3740 A6
- 3741 A6
- 3742 B6
- 3743 B6
- 3744 E7
- 3745 B6
- 3746 E6
- 3747 D6
- 3748 E6
- 3749 D6
- 3750 E6
- 3751 E7
- 3752 B3
- 3753 C3
- 4701 A5
- 4702 B5
- 4703 D5
- 4704 B7
- 4705 B7
- 4706 A11
- 4707 B11
- 4708 E3
- 4709 E3
- 4710 F8
- 4711 F8
- 4714 G3
- 4715 F3
- 4716 F4
- 4720 B2
- 4720 B2
- 4721 B2
- 4722 C2
- 4735 E9
- 4736 E9
- 4737 G7
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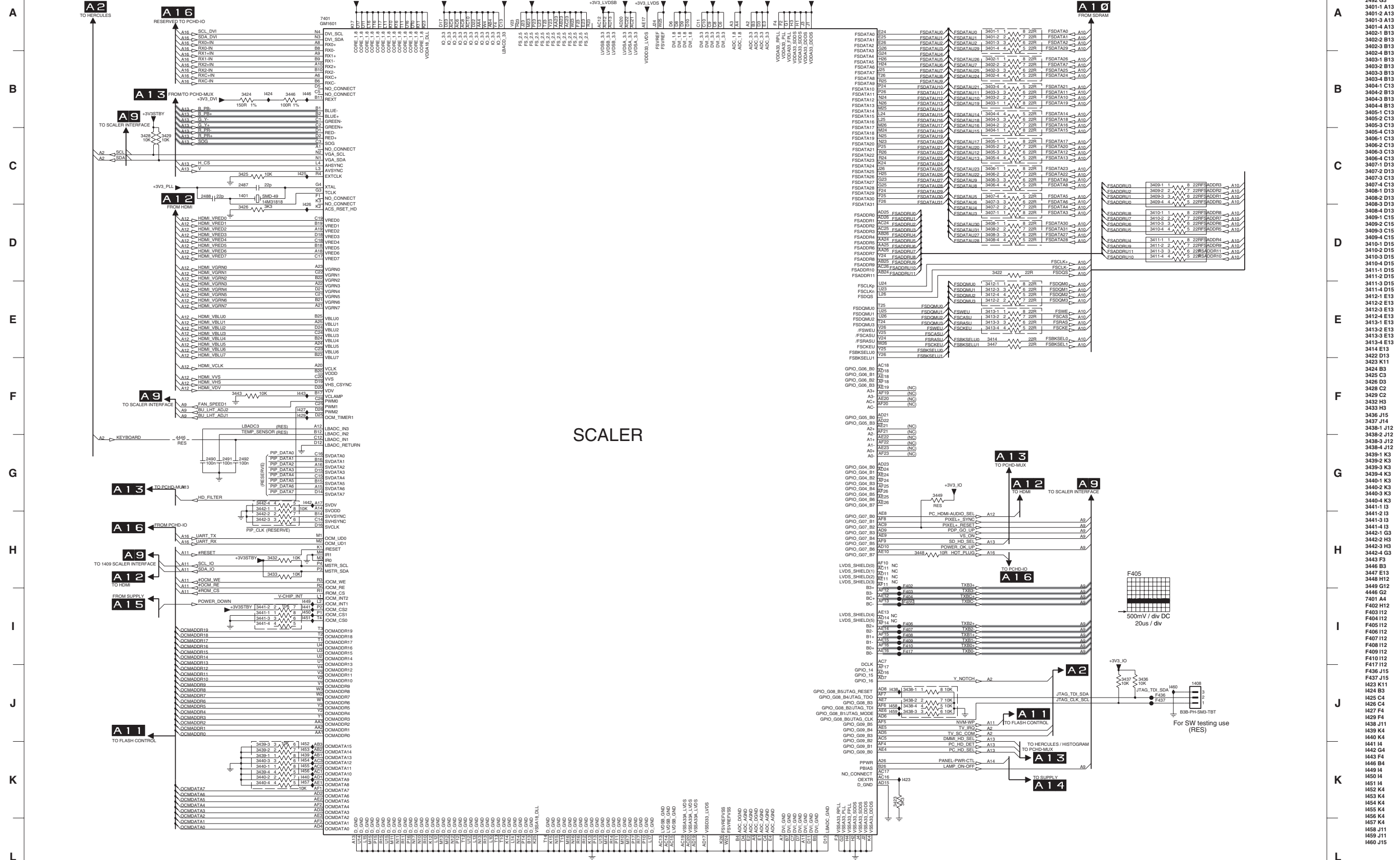
SSB: TV Supply

A6 TV-SUPPLY



- 2910 D8
- 2911 D9
- 2920 E4
- 2921 E5
- 2930 C3
- 2931 B6
- 2932 C4
- 2933 C7
- 2934 C4
- 2935 C8
- 3910 B7
- 3911 D7
- 3930 B3
- 3931 B4
- 3932 C4
- 3933 C4
- 5910 D8
- 5920 E3
- 5930 C3
- 5931 B7
- 5932 C8
- 6910 D8
- 6911 D9
- 6930 C7
- 7910 D7
- 7920 E4
- 7930 A5
- F912 D9
- F913 E9
- F915 C9
- I901 B4
- I902 C3
- I903 C4
- I904 B7
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- I906 C7
- I907 D8
- I908 D7

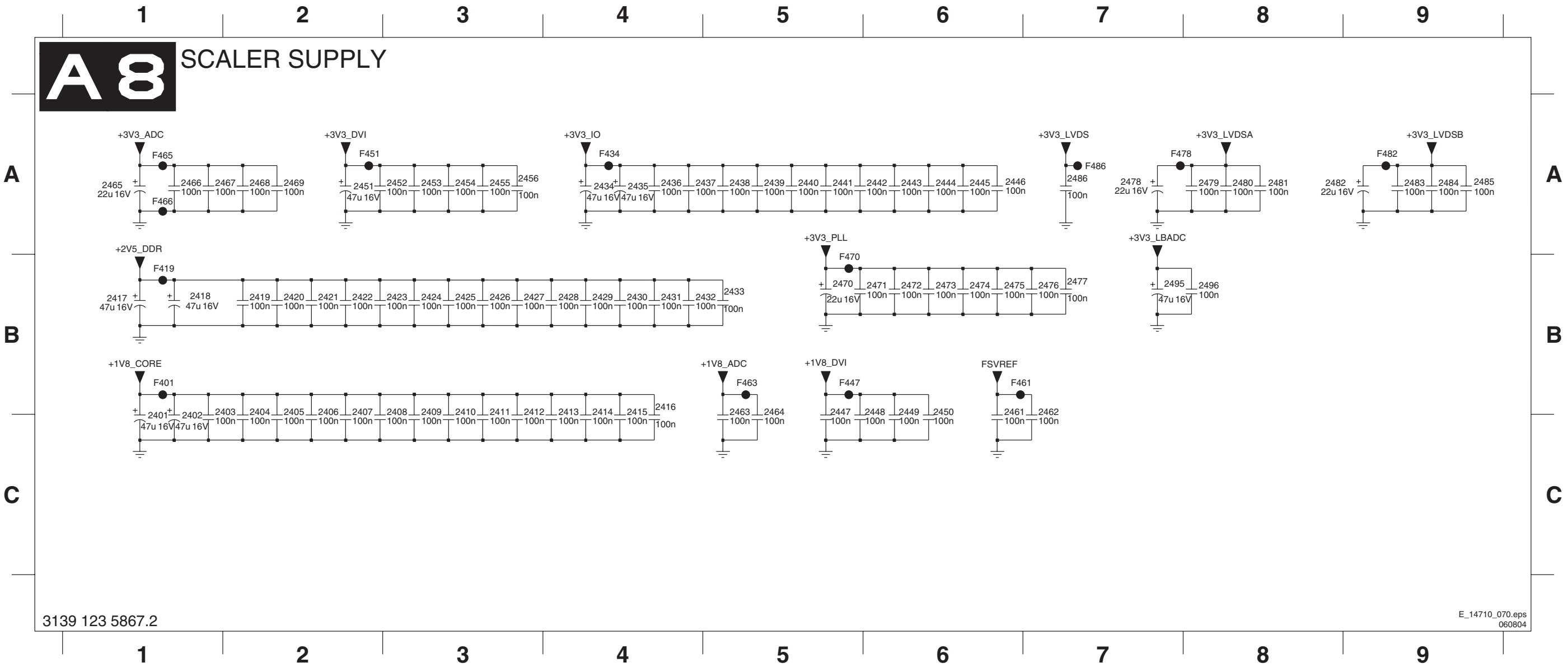
A 7 SCALER



E_14710_069.eps
100804

SSB: Scaler Supply

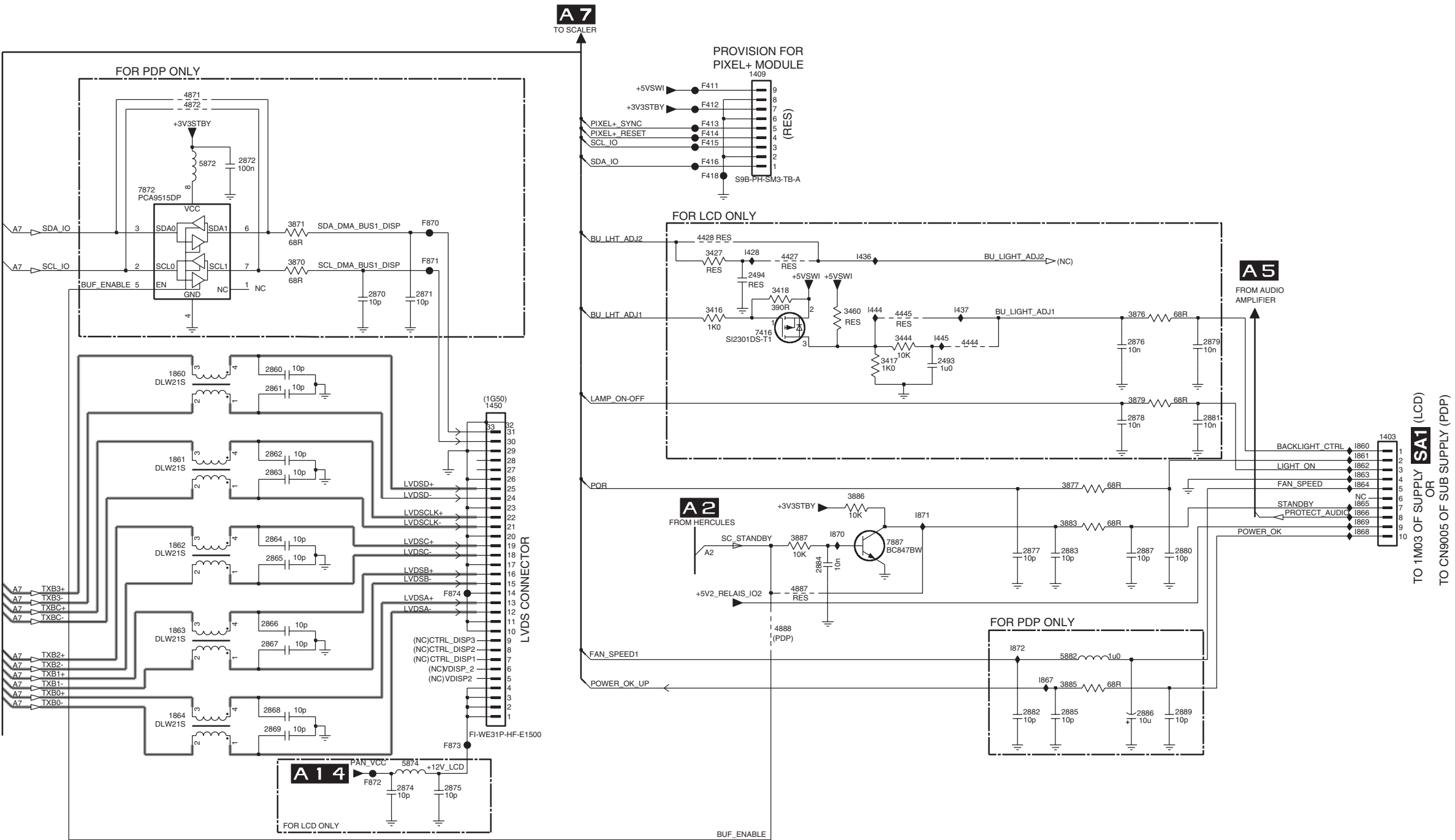
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2402 B1	2406 B2	2410 B3	2414 B4	2418 B1	2422 B2	2426 B3	2430 B4	2434 A4	2438 A5	2442 A6	2446 A6	2450 B6	2454 A3	2462 B7	2466 A1	2470 B5	2474 B6	2478 A7	2482 A8	2486 A7	F419 B1	F461 B6	F470 B5	
2403 B2	2407 B2	2411 B3	2415 B4	2419 B2	2423 B3	2427 B3	2431 B4	2435 A4	2439 A5	2443 A6	2447 B5	2451 A2	2455 A3	2463 B5	2467 A2	2471 B6	2475 B6	2479 A8	2483 A9	2495 B7	F434 A4	F463 B5	F478 A7	
2404 B2	2408 B3	2412 B3	2416 B4	2420 B2	2424 B3	2428 B4	2432 B5	2436 A4	2440 A5	2444 A6	2448 B6	2452 A3	2456 A3	2464 B5	2468 A2	2472 B6	2476 B7	2480 A8	2484 A9	2496 B8	F447 B5	F465 A1	F482 A9	



SSB: Scaler Interface

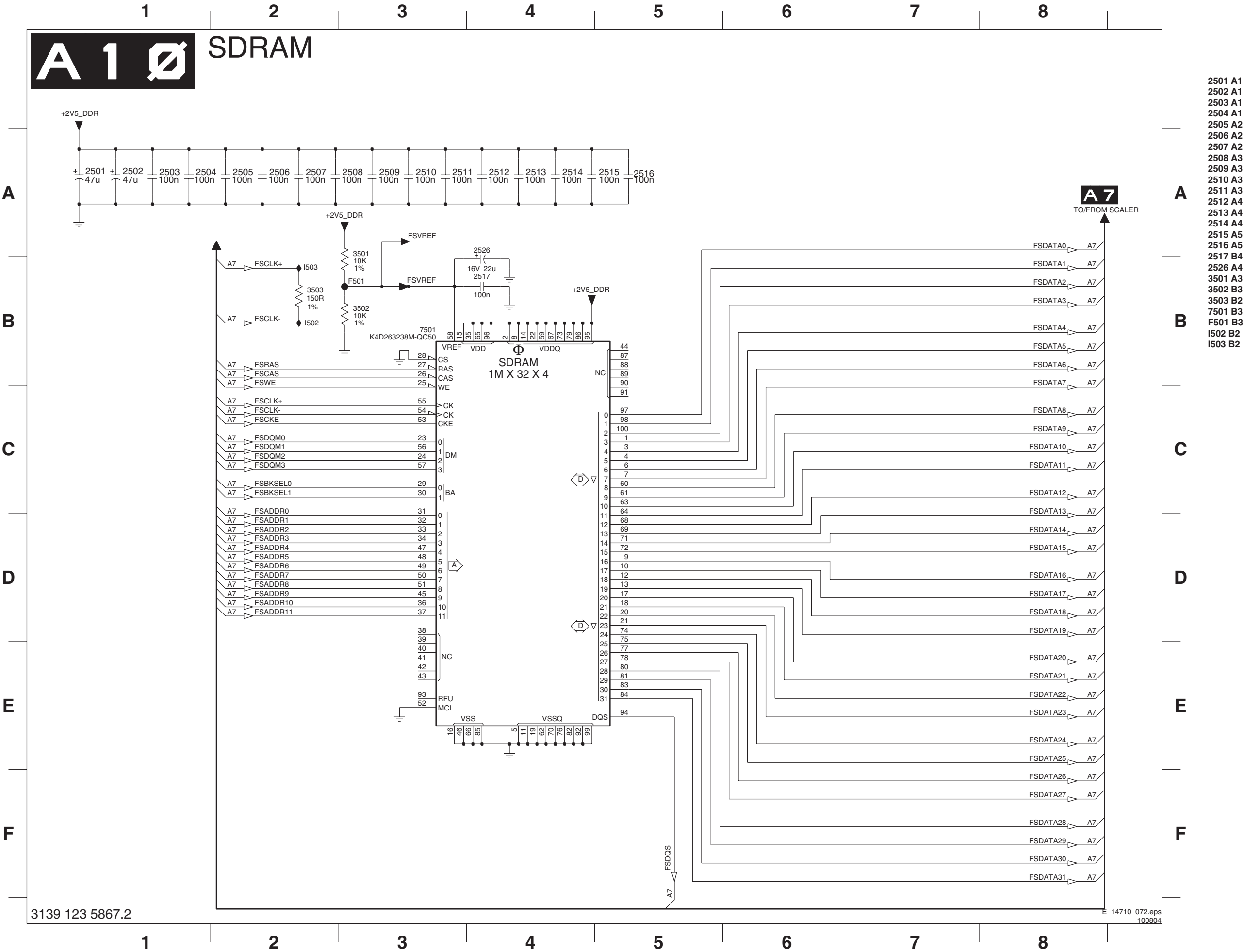
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SCALER INTERFACE

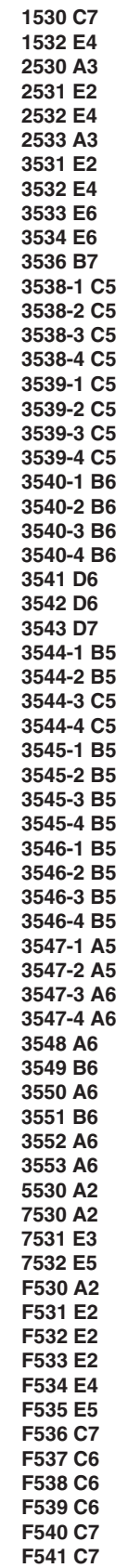


- 1403 D12
- 1409 A7
- 1450 D5
- 1860 D3
- 1861 D3
- 1862 E3
- 1863 F3
- 1864 F3
- 2493 C9
- 2494 C7
- 2860 D3
- 2861 D3
- 2862 D3
- 2863 D3
- 2864 E3
- 2865 E3
- 2866 E3
- 2867 F3
- 2868 F3
- 2869 F3
- 2870 C4
- 2871 C5
- 2872 B3
- 2874 G4
- 2875 G5
- 2876 C10
- 2877 E9
- 2878 D10
- 2879 C11
- 2880 E10
- 2881 D11
- 2882 F9
- 2883 E9
- 2884 E8
- 2885 F9
- 2886 F10
- 2887 E10
- 2889 F10
- 3416 C7
- 3417 C8
- 3418 C7
- 3427 C7
- 3444 C8
- 3460 C8
- 3870 C4
- 3871 B4
- 3876 C10
- 3877 D9
- 3879 D10
- 3883 E9
- 3885 F9
- 3886 D8
- 3887 E7
- 4427 C7
- 4428 C7
- 4444 C9
- 4445 C8
- 4871 B3
- 4872 B3
- 4887 E7
- 4888 E7
- 5872 B3
- 5874 G5
- 5882 F9
- 7416 C7
- 7872 B2
- 7887 E8
- F411 A7
- F412 B7
- F413 B7
- F414 B7
- F415 B7
- F416 B7
- F418 B5
- F870 B5
- F871 C5
- F872 G4
- F873 F5
- F874 E5
- I428 C7
- I436 C8
- I437 C9
- I444 C8
- I445 C9
- I860 D12
- I861 D12
- I862 D12
- I863 D12
- I864 D12
- I865 E12
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- I867 F9
- I868 E12
- I869 E12
- I870 E8
- I871 E8
- I872 F9

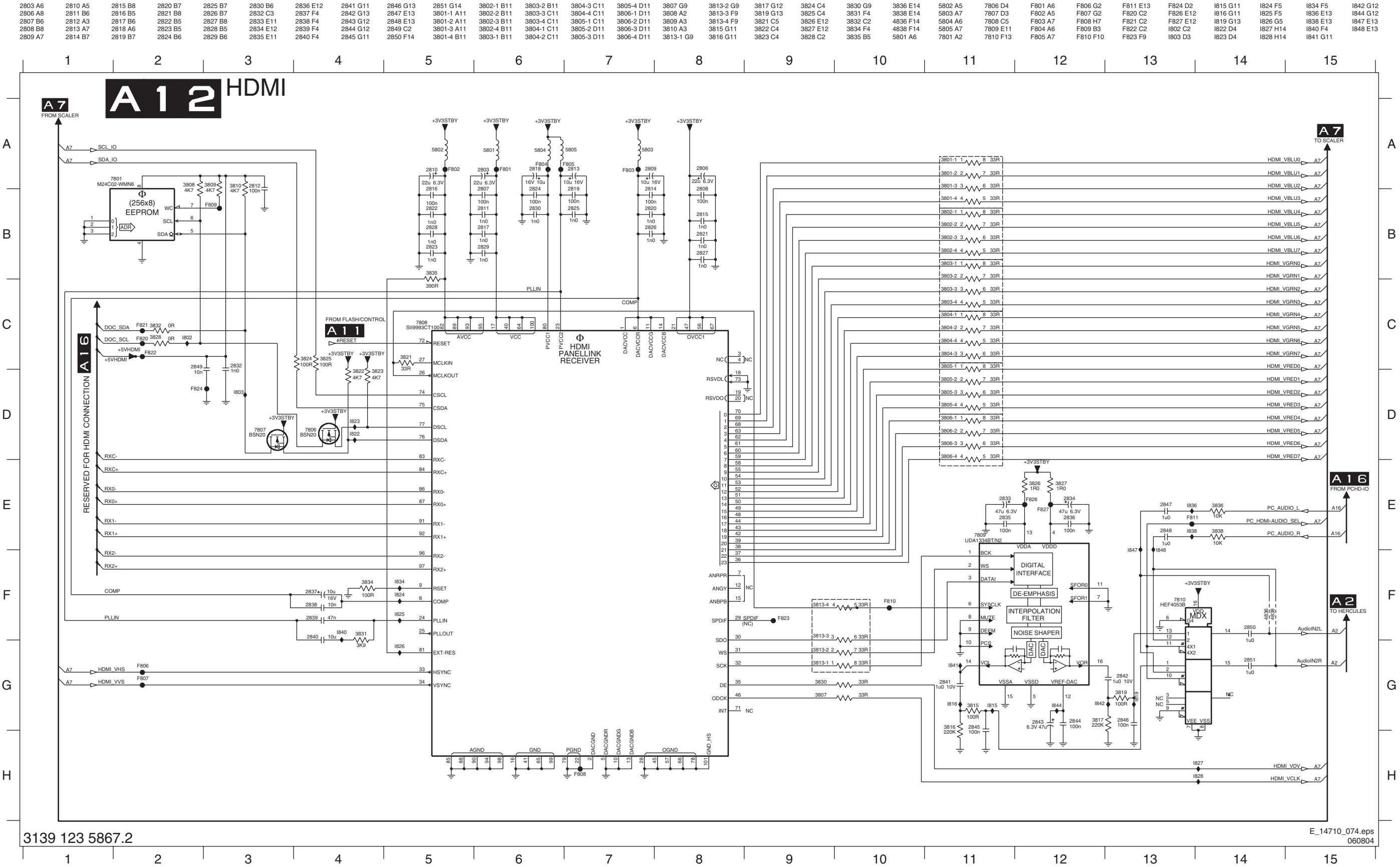
SSB: SDRAM



A 1 1 FLASH / CONTROL



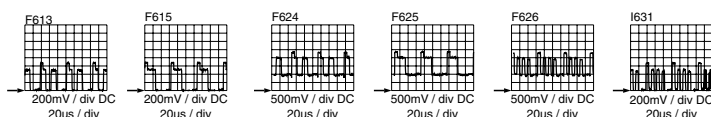
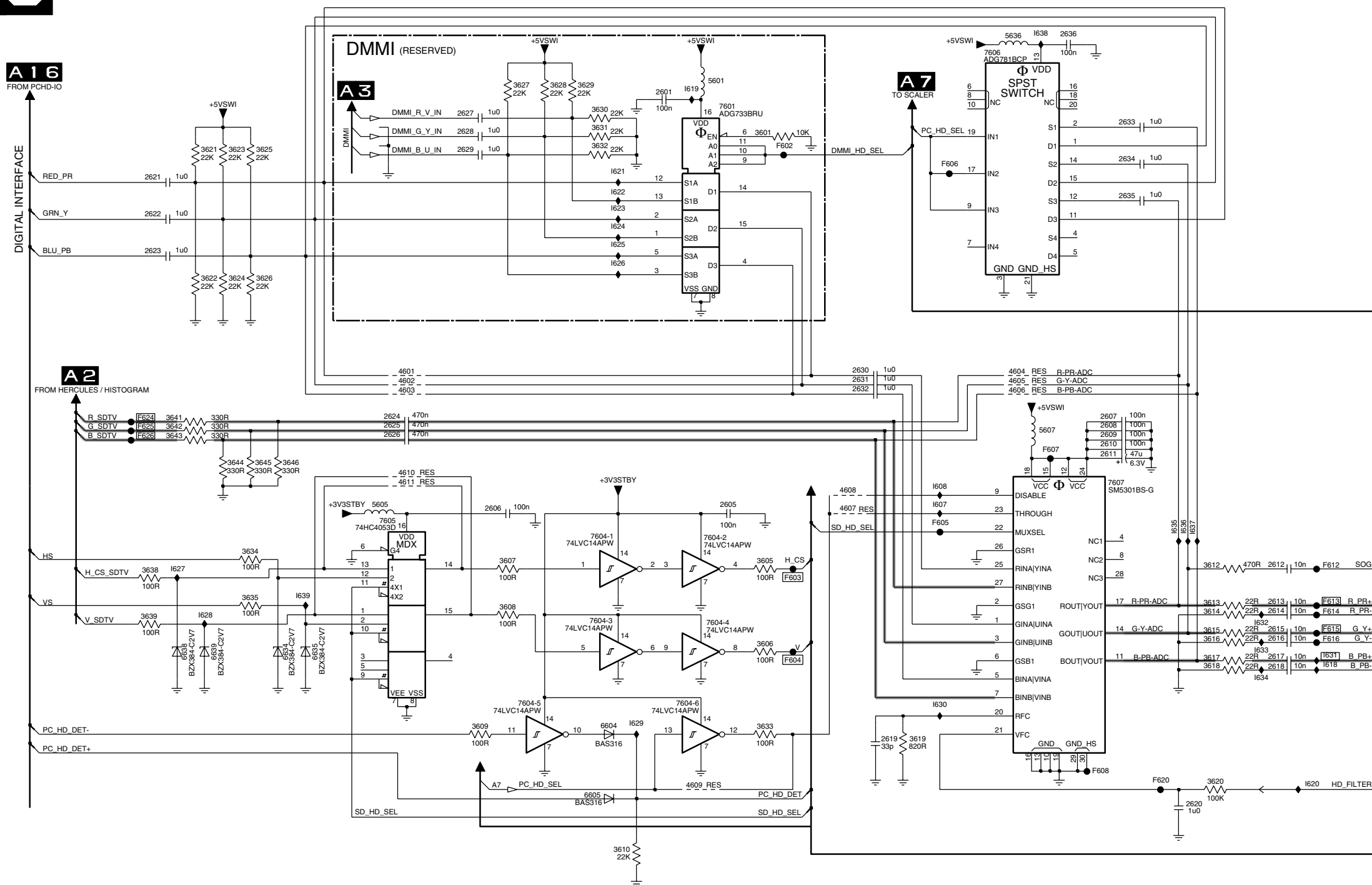
SSB: HDMI



3139 123 5867.2

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A 13 PCHD-MUX



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100904

2601 A7	7606 A9
2605 E7	7607 D10
2606 E5	F602 B7
2607 D10	F603 E8
2608 D10	F604 F8
2609 D10	F605 E9
2610 D10	F606 B9
2611 D10	F607 D10
2612 E11	F608 G10
2613 E11	F612 E12
2614 E11	F613 E12
2615 F11	F614 E12
2616 F11	F615 F12
2617 F11	F616 F12
2618 F11	F620 G10
2619 F8	F624 D2
2620 G11	F625 D2
2621 B3	F626 D2
2622 B3	I607 E9
2623 C3	I608 D9
2624 D4	I618 F12
2625 D4	I619 A7
2626 D4	I620 G12
2627 A5	I621 B6
2628 B5	I622 B6
2629 B5	I623 B6
2630 C8	I624 B6
2631 D8	I625 C6
2632 D8	I626 C6
2633 B10	I627 E3
2634 B10	I628 E3
2635 B10	I629 F6
2636 A10	I630 F9
3601 B7	I631 F12
3605 E7	I632 E11
3606 F7	I633 F11
3607 E5	I634 F11
3608 E5	I635 E10
3609 F5	I636 E11
3610 G6	I637 E11
3612 E11	I638 A9
3613 E11	I639 E4
3614 E11	
3615 F11	
3616 F11	
3617 F11	
3618 F11	
3619 F8	
3620 G11	
3621 B3	
3622 C3	
3623 B3	
3624 C3	
3625 B3	
3626 C3	
3627 A5	
3628 A6	
3629 A6	
3630 A6	
3631 B6	
3632 B6	
3633 F7	
3634 E3	
3635 E3	
3638 E2	
3639 E2	
3641 D3	
3642 D3	
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4609 G7	
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4611 D5	
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5605 E4	
5607 D9	
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6605 G6	
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6635 F4	
6638 F3	
6639 F3	
7601 A7	
7604-1 E6	
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7605 E4	

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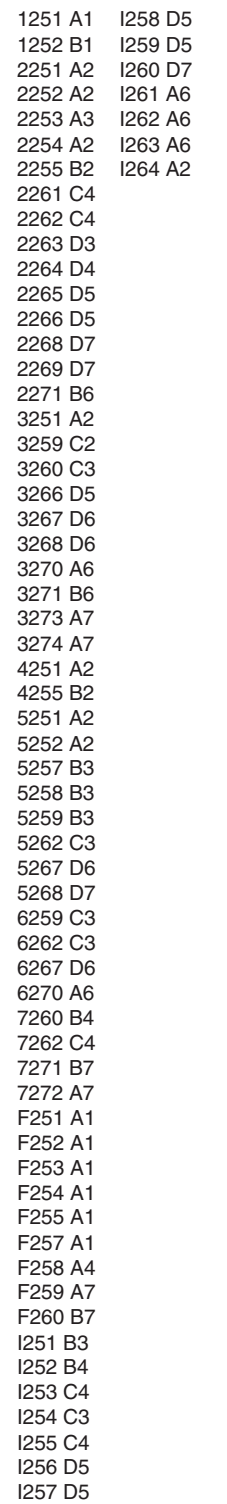
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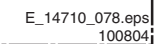
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"980"~"999"

A 15 DC-DC CONVERTER



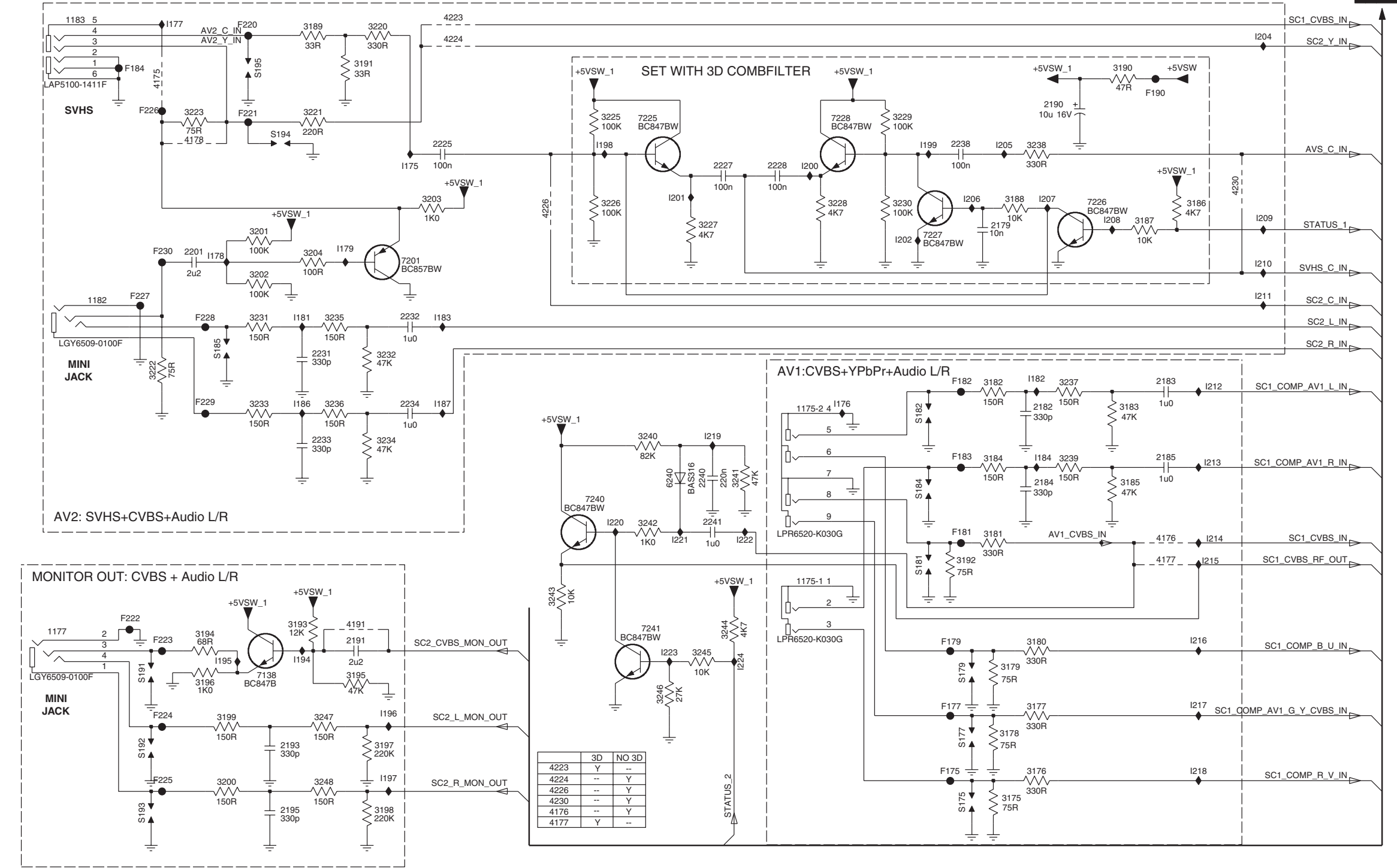
A 16 PCHD-IO



1686 E1	I154 D8
1687 A1	I158 E4
1688 E6	I159 E4
1690 E8	I682 A2
1691 E7	I683 A3
1692 E8	I684 A2
1693 E7	I685 D2
2682 D6	S698 E2
2683 B2	S699 E2
2688 C6	
2693 C2	
2698 E3	
2699 E4	
2784 B1	
2785 B2	
3682 C6	
3688 D6	
3690 C6	
3691 A6	
3692 A6	
3693 D3	
3694 C6	
3695 B6	
3696 D4	
3697 D4	
3698 E2	
3699 E2	
3700 E3	
3781 E4	
3785 B5	
3786 D4	
3787 D4	
3789 A2	
3790 A3	
3791 A2	
3792 C6	
3793 F7	
5681 C5	
5682 C5	
5688 A6	
5689 A6	
5690 B6	
5691 A3	
6692 A3	
7693 D2	
F150 E6	
F151 E6	
F152 E6	
F153 E6	
F154 E6	
F155 E6	
F156 E6	
F157 F6	
F158 F6	
F159 F6	
F160 F6	
F161 F6	
F162 E6	
F163 A1	
F164 D3	
F165 E1	
F166 E2	
F167 E2	
F168 A2	
F169 A2	
F170 A2	
F171 A2	
F172 A2	
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F176 B2	
F178 B2	
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I151 C8	
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I153 D8	

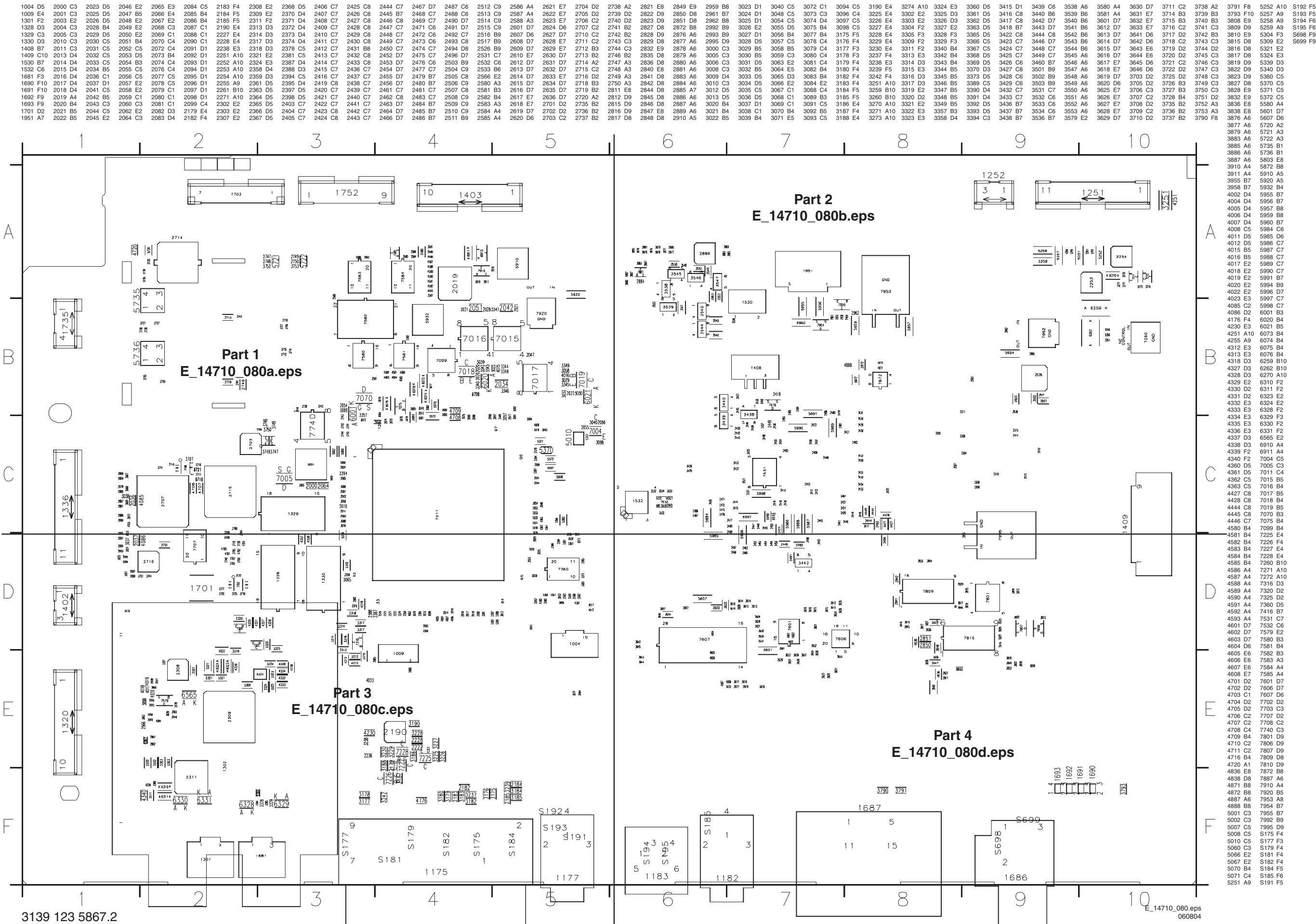
SSB: Cinch IO

A17 CINCH-IO



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1175-2 C6	3239 D7	I209 B9
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1182 C1	3241 D5	I211 C9
1183 A1	3242 D5	I212 C8
2179 B7	3243 E4	I213 D8
2182 C7	3244 E5	I214 D8
2183 C8	3245 E5	I215 D8
2184 D7	3246 E5	I216 E8
2185 D8	3247 E3	I217 E8
2190 A7	3248 F3	I218 F8
2191 E3	4175 A1	I219 D5
2193 F2	4176 D8	I220 D4
2195 F2	4177 D8	I221 D5
2201 B2	4178 B2	I222 D5
2225 B3	4191 E3	I223 E5
2227 B5	4223 A3	I224 E5
2228 B6	4224 A3	S175 F7
2231 C2	4226 B4	S177 F7
2232 C3	4230 B9	S179 E7
2233 D2	6240 D5	S181 D6
2234 C3	7138 E2	S182 C6
2238 B7	7201 B3	S184 D6
2240 D5	7225 A5	S185 C2
2241 D5	7226 B8	S191 E1
3175 F7	7227 B6	S192 F1
3176 F7	7228 A6	S193 F1
3177 E7	7240 D4	S194 B2
3178 F7	7241 E5	S195 A2
3179 E7	F175 F7	
3180 E7	F177 E7	
3181 D7	F179 E7	
3182 C7	F181 D7	
3183 C8	F182 C7	
3184 D7	F183 D7	
3185 D8	F184 A1	
3186 B8	F190 A8	
3187 B8	F220 A2	
3188 B7	F221 A2	
3189 A2	F222 E1	
3190 A8	F223 E1	
3191 A3	F224 E1	
3192 D7	F225 F1	
3193 E2	F226 A1	
3194 E2	F227 C1	
3195 E3	F228 C2	
3196 E2	F229 C2	
3197 F3	F230 B1	
3198 F3	I175 B3	
3199 E2	I176 C6	
3200 F2	I177 A2	
3201 B2	I178 B2	
3202 C2	I179 B3	
3203 B3	I181 C2	
3204 B2	I182 C7	
3220 A3	I183 C3	
3221 A2	I184 D7	
3222 C1	I186 C2	
3223 A2	I187 C3	
3225 A4	I194 E2	
3226 B4	I195 E2	
3227 B5	I196 E3	
3228 B6	I197 F3	
3229 A6	I198 B4	
3230 B6	I199 B7	
3231 C2	I200 B6	
3232 C3	I201 B5	
3233 C2	I202 B6	
3234 D3	I204 A9	
3235 C3	I205 B7	
3236 C3	I206 B7	
3237 C7	I207 B7	

Layout Small Signal Panel (Top Side Overview)



A horizontal number line with tick marks at 1, 2, 3, 4, and 5. The numbers are written above the tick marks.



10

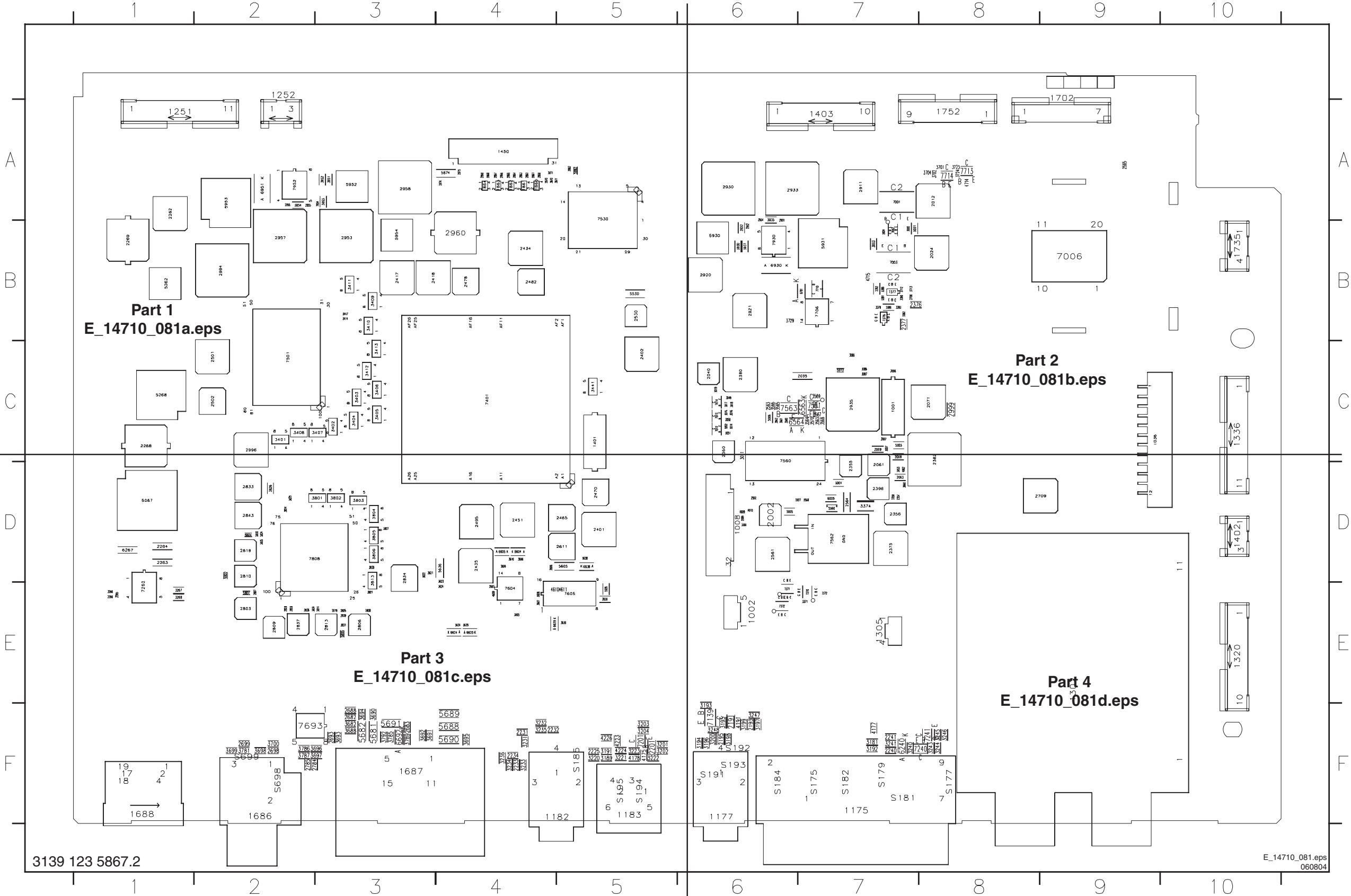


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[illegible]

Layout Small Signal Panel (Bottom Side Overview)

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002	E6	2006	C7	2089	D6	2262	A1	2376	B7	2435	D4	2562	D6	2693	F3	2810	D2	2837	E2	2868	A4	2932	B6	2996	C2	3018	C6	3189	F5	3202	F5	3236	F4	3269	D7	3402	C3	3414	B3	3569	C7	3634	E4	3696	F3	3729	B6	3806	D3	3871	A4	4175	F5	5003	C7	5681	F3	5930	B6	6634	E4	7012	C6	7377	B7	7710	B7
006	D6	2007	C7	2191	F6	2263	D1	2377	B7	2451	D4	2563	C6	2698	F2	2813	E3	2838	E2	2869	A4	2933	A6	2999	C8	3019	C6	3191	F5	3203	F5	3240	F7	3364	D6	3403	C3	3441	C5	3570	C7	3635	E4	3697	F3	3781	F2	3807	D3	3930	B6	4177	F7	5004	D7	5682	F3	5931	B7	6635	E4	7013	C6	7401	C4	7713	A8
036	C9	2008	C7	2193	F6	2264	D1	2380	C6	2465	D5	2564	D7	2699	F2	2814	E3	2839	E3	2870	A4	2934	A6	3001	B7	3049	C6	3192	F7	3204	F5	3241	F7	3371	E7	3404	C3	3447	B3	3605	E4	3638	D5	3698	F2	3785	F3	3813	D3	3931	B6	4178	F5	5005	D6	5688	F4	5952	A3	6638	D5	7014	C6	7501	C2	7714	A8
305	E7	2009	C7	2195	F6	2265	E1	2382	C8	2470	D5	2565	A9	2708	B7	2818	D2	2843	D2	2871	A4	2935	C7	3002	B7	3050	C6	3193	F6	3220	F5	3243	F8	3372	E7	3405	C3	3560	C6	3606	D4	3639	E5	3699	F2	3786	F2	3821	E3	3932	B6	4191	F6	5006	C6	5689	F4	5953	A2	6639	E4	7139	F6	7530	A5	7808	D2
401	C5	2012	A8	2201	F5	2266	E1	2386	B7	2478	B4	2605	E4	2709	D9	2819	E3	2860	A4	2874	A4	2953	B3	3003	B7	3051	C6	3194	F6	3221	F5	3244	F8	3374	D7	3406	C3	3561	C6	3607	E4	3682	F3	3700	F2	3787	F2	3824	D2	3933	A6	4223	F5	5072	C7	5690	F4	5954	B3	6692	F3	7201	F5	7560	C6	7930	B6
450	A4	2024	B8	2225	F5	2268	C1	2392	B7	2482	B4	2606	D4	2784	F2	2820	E2	2861	A4	2875	A4	2954	A3	3004	B7	3052	C6	3195	F6	3222	F5	3245	F8	3378	B7	3407	C3	3562	C6	3608	E4	3688	F3	3701	A8	3789	F3	3825	D2	3951	A3	4224	F5	5262	B1	5691	F3	6005	D7	6701	B7	7240	F8	7561	C7	7952	A2
460	A4	2027	D7	2231	F4	2269	B1	2396	D7	2495	D4	2611	D5	2785	F2	2824	D2	2862	A4	2882	A5	2955	A2	3007	C7	3053	D7	3196	F6	3223	F5	3246	F8	3380	B7	3408	C2	3563	C7	3609	D4	3690	F3	3702	A8	3792	F3	3826	D2	3952	A3	4226	F5	5267	D1	5801	E2	6240	F7	6930	B6	7241	F8	7562	D7		
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863	A4	2061	D7	2234	F4	2357	D7	2417	B3	2530	B5	2682	F3	2807	E2	2830	D2	2865	A4	2921	B6	2958	A3	3015	C6	3086	C7	3199	F6	3233	F4	3266	E1	3383	B7	3411	B3	3566	C6	3622	D3	3693	F3	3713	B7	3803	D3	3834	E2	4009	D6	4611	E5	5560	D7	5805	E3	6564	C6	7002	B7	7371	E6	7605	E5		
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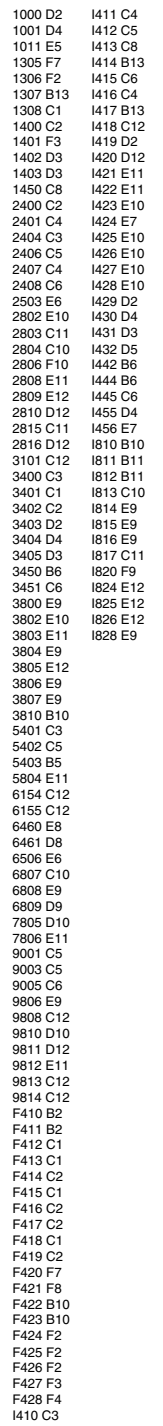
Part 3

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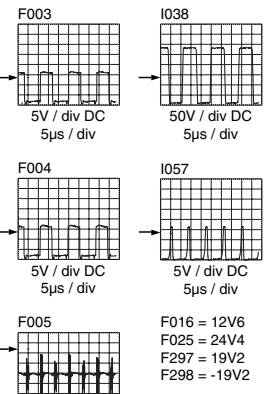
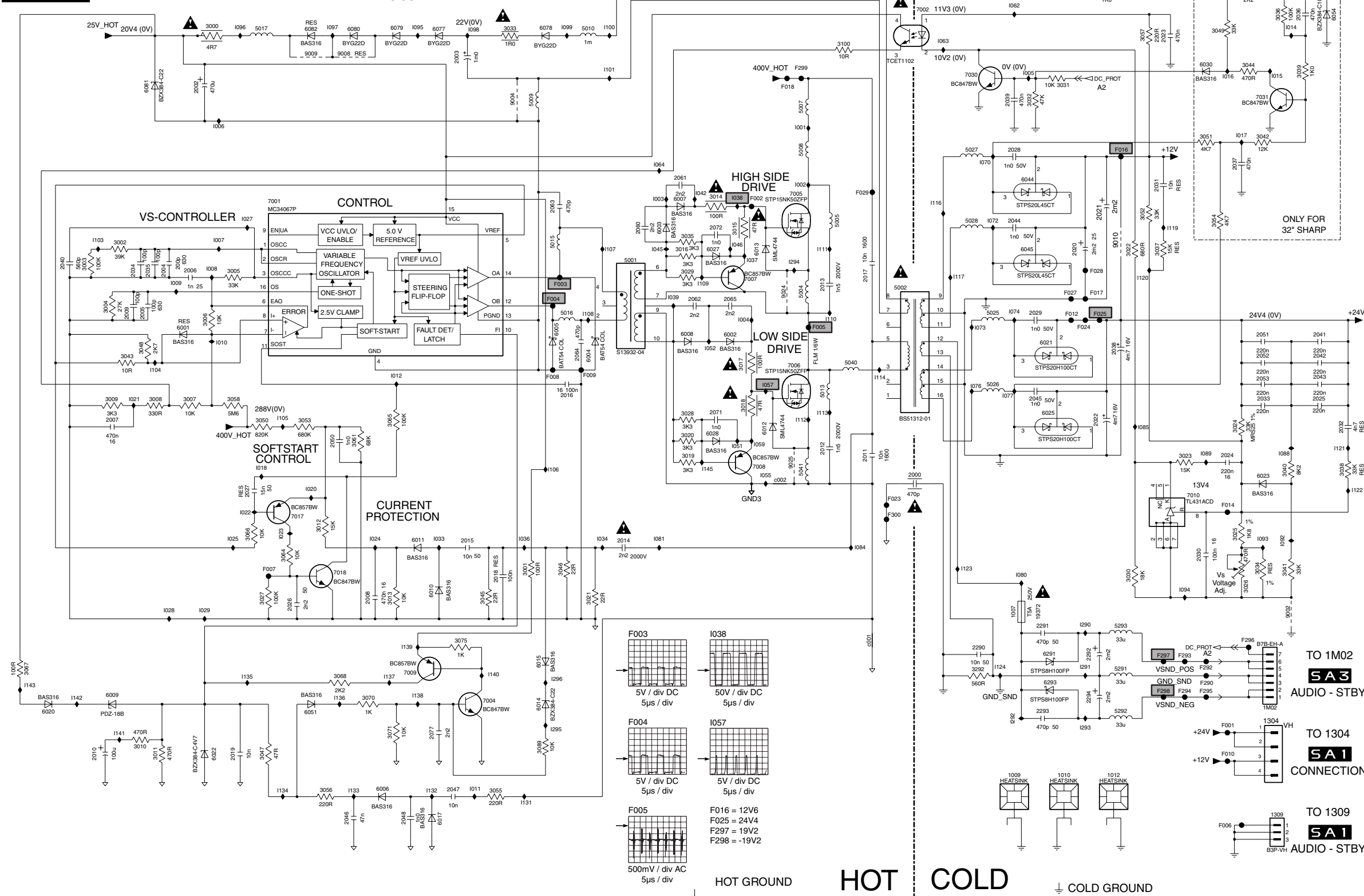
AS1 MAINS FILTER + STANDBY



Power Supply Unit (30-32 Inch): Supply

AS2 SUPPLY

HOT COLD



HOT GROUND

HOT COLD

COLD GROUND

3104 313 6009.5

TO 1M02
SA3
AUDIO - STBY

TO 1304
SA1
CONNECTION

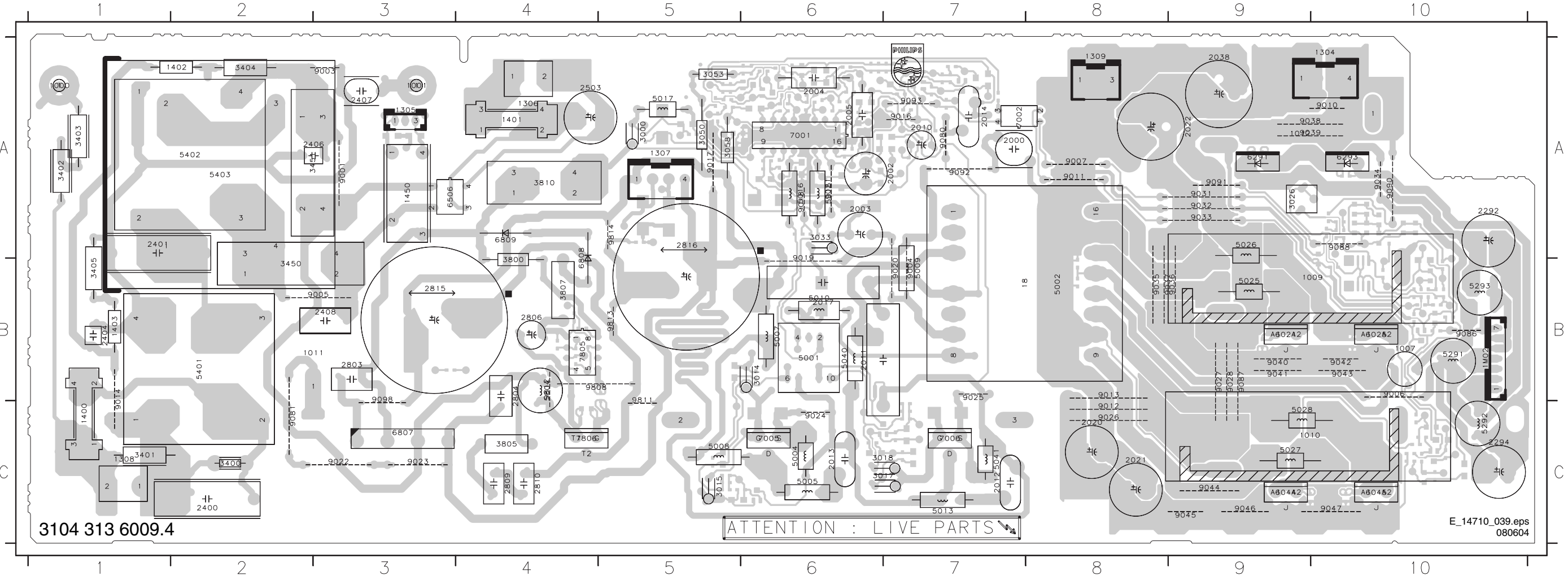
TO 1309
SA1
AUDIO - STBY

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230604

1007 G10	3043 D1	F010 H12	I137 G4
1009 H10	3044 A13	F012 D11	I138 H4
1010 H11	3045 G5	F014 F12	I139 G4
1012 H11	3046 F6	F016 B11	I140 G5
1304 H13	3047 H3	F017 D11	I141 H1
1309 I13	3048 D2	F018 A8	I142 H1
1M02 H13	3049 A12	F021 A11	I143 G1
2000 E9	3050 E3	F022 A12	I145 E7
2002 A2	3051 B12	F023 F9	I290 G11
2003 A5	3052 C12	F024 D11	I291 G11
2004 C2	3053 E3	F025 D11	I292 H10
2005 D2	3054 C12	F027 D11	I293 H11
2006 C2	3055 I5	F028 C11	I294 C8
2007 E1	3056 I3	F029 C9	I295 H6
2008 G4	3057 A12	F290 G12	I296 G6
2009 D1	3058 E2	F292 G12	C001 G9
2010 H1	3059 A13	F293 G12	C002 E8
2011 E9	3061 E4	F294 H12	
2012 E8	3064 F3	F295 H12	
2013 C8	3065 E4	F296 G13	
2014 F6	3066 F3	F297 G12	
2015 F5	3067 G1	F298 H12	
2016 E6	3068 G4	F299 A8	
2017 C9	3070 H4	F300 F9	
2018 F5	3071 H4	I001 B8	
2019 H2	3075 G5	I002 B8	
2020 C11	3089 H6	I003 C7	
2021 C11	3100 A9	I004 D8	
2022 E11	3292 G10	I005 A10	
2023 A12	3999 A11	I006 B2	
2024 E12	5001 C6	I007 C2	
2025 E13	5002 D9	I008 C2	
2026 G3	5004 D8	I009 C2	
2027 F3	5005 C9	I010 D2	
2028 B10	5007 B8	I011 I5	
2029 D11	5008 B8	I012 D4	
2030 F12	5009 B5	I013 A3	
2031 B12	5010 A6	I014 A13	
2032 E13	5013 E8	I015 A13	
2033 E13	5015 C6	I016 A12	
2034 C1	5016 D6	I017 B13	
2035 C2	5017 A3	I018 C1	
2036 A13	5025 D10	I020 F3	
2037 B13	5026 D10	I021 E1	
2038 D11	5027 B10	I022 F3	
2039 B10	5028 C10	I023 F3	
2040 C1	5040 D9	I024 F4	
2041 D13	5041 E8	I025 F2	
2042 D13	5291 G11	I027 C3	
2043 D13	5292 H11	I028 G2	
2044 C10	5293 G11	I029 G2	
2045 E11	6001 D2	I033 F5	
2046 I4	6002 D7	I034 F6	
2047 I5	6003 C7	I036 F5	
2048 I4	6004 D6	I037 C8	
2050 E3	6005 D6	I038 C8	
2051 D13	6006 I4	I039 D7	
2052 D13	6007 C7	I042 C7	
2053 D13	6008 D7	I045 C7	
2060 C7	6009 H1	I046 C8	
2061 B7	6010 G4	I051 B8	
2062 D7	6011 F4	I052 D7	
2063 C6	6012 E8	I055 E8	
2064 D6	6013 C8	I057 D8	
2065 D7	6014 H6	I059 E8	
2071 E7	6015 G6	I062 A10	
2072 C7	6017 I5	I063 A10	
2077 H4	6020 H1	I064 B7	
2290 G10	6021 D11	I070 B10	
2291 G11	6022 H2	I072 C10	
2292 G11	6023 E13	I073 D10	
2293 H11	6025 E11	I074 D10	
2294 H11	6027 C7	I076 D10	
3000 A2	6028 E7	I077 E10	
3001 F5	6030 A12	I080 F10	
3002 C1	6044 B10	I081 F7	
3003 C1	6045 C10	I084 F9	
3004 D1	6051 H3	I085 E12	
3005 C2	6054 A13	I088 E13	
3006 D2	6077 A5	I089 E12	
3007 E2	6078 A6	I092 F13	
3008 E2	6079 A4	I093 F13	
3009 E1	6080 A4	I094 G12	
3010 H2	6081 A2	I095 A4	
3011 H2	6082 A3	I096 A3	
3012 F3	6291 G11	I097 A3	
3013 G4	6293 G11	I098 A5	
3014 C7	7001 C3	I099 A6	
3015 C8	7002 A9	I100 A6	
3016 C7	7004 H5	I101 A6	
3017 D8	7005 C8	I103 C1	
3018 E8	7006 D8	I104 D2	
3019 E7	7007 C8	I105 E3	
3020 E7	7008 E8	I106 E8	
3021 G6	7009 G4	I107 C8	
3022 C11	7010 F12	I108 D6	
3023 E12	7017 F3	I109 C7	
3024 E13	7018 F3	I110 D8	
3025 F13	7030 A10	I111 C8	
3026 G13	7031 B13	I112 E8	
3027 G3	9002 G13	I113 E8	
3028 E7	9004 B5	I114 D9	
3029 C7	9008 A4	I116 C10	
3030 F11	9009 A3	I117 C10	
3031 A11	9010 C11	I119 C12	
3032 B10	9024 D8	I120 C12	
3033 A5	9025 E8	I121 E13	
3034 F13	F001 H12	I122 F13	
3035 C7	F002 C8	I123 F10	
3036 A13	F003 C6	I124 G10	
3037 C12	F004 D6	I131 I5	
3038 E13	F005 D8	I132 I4	
3039 A13	F006 I12	I133 I4	
3040 E13	F007 F3	I134 I3	
3041 F13	F008 D6	I135 G3	
3042 B13	F009 D6	I136 H4	

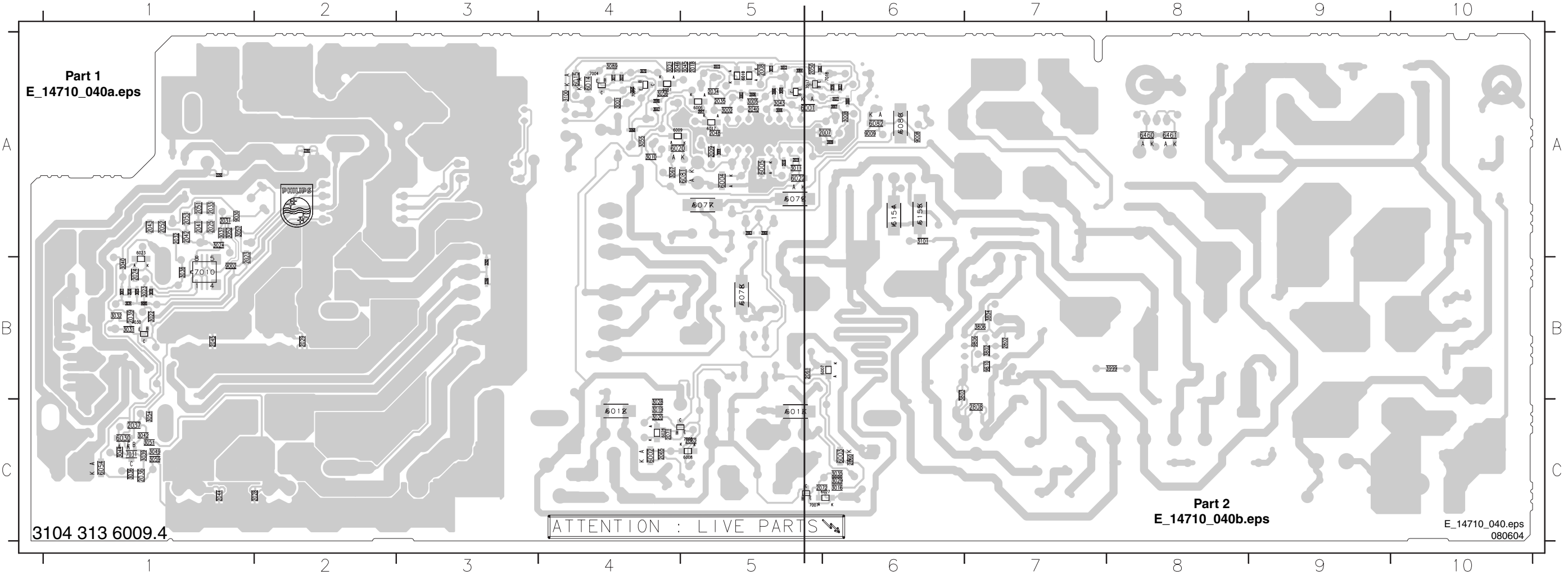
Layout Power Supply Unit (30-32 Inch) (Top Side)

1000 A1	1304 A10	1401 A4	2003 A6	2014 A7	2294 C10	2503 A4	2816 A5	3033 A6	3403 A1	3807 B4	5008 C5	5025 B9	5292 C10	6025 B10	6808 A4	7806 C4	9010 A10	9018 A6	9025 B7	9034 A10	9041 B9	9080 A7	9092 A7	9814 A5
1001 A3	1305 A3	1402 A2	2004 A6	2017 B6	2400 C2	2803 B3	3000 A5	3050 A5	3404 A2	3810 A4	5009 B7	5026 A9	5293 B10	6044 C10	6809 A4	9001 A3	9011 A8	9019 A6	9026 C8	9035 B8	9042 B10	9081 C2	9093 A7	
1007 B10	1306 A4	1403 B1	2005 A6	2020 C8	2401 B1	2804 B4	3014 B6	3053 A5	3405 B1	5001 B6	5010 B6	5027 C9	5401 B2	6045 C10	7001 A6	9003 A3	9012 C8	9020 B7	9027 B9	9036 B9	9043 B10	9086 B10	9098 B3	
1009 B9	1307 A5	1450 A3	2010 A7	2021 C8	2404 B1	2806 B4	3015 C5	3058 A5	3450 A2	5002 A7	5013 C7	5028 C9	5402 A1	6291 A9	7002 A8	9004 A7	9013 B8	9021 A6	9028 B9	9037 B8	9044 C9	9087 B9	9808 B5	
1010 C9	1308 C1	1M02 B10	2011 B7	2022 A8	2406 A3	2809 C4	3017 C7	3400 C2	3451 A3	5004 C6	5015 A6	5040 B6	5403 A3	6293 A10	7005 C6	9005 B3	9014 B1	9022 C3	9031 A9	9038 A9	9045 C9	9088 A10	9811 B5	
1011 C3	1309 A8	2000 A7	2012 C7	2038 A9	2407 A3	2810 C4	3018 C7	3401 C2	3800 A4	5005 C6	5016 A6	5041 C7	5804 B4	6506 A4	7006 C7	9006 C10	9016 A7	9023 C3	9032 A9	9039 A9	9046 C9	9090 A10	9812 B4	
1012 A9	1400 C1	2002 A7	2013 C6	2292 A10	2408 B3	2815 A3	3026 A9	3402 A1	3805 C4	5007 B6	5017 A5	5291 B10	6021 B9	6807 C3	7805 B4	9007 A8	9017 A5	9024 C6	9033 A9	9040 B9	9047 C10	9091 A9	9813 B5	

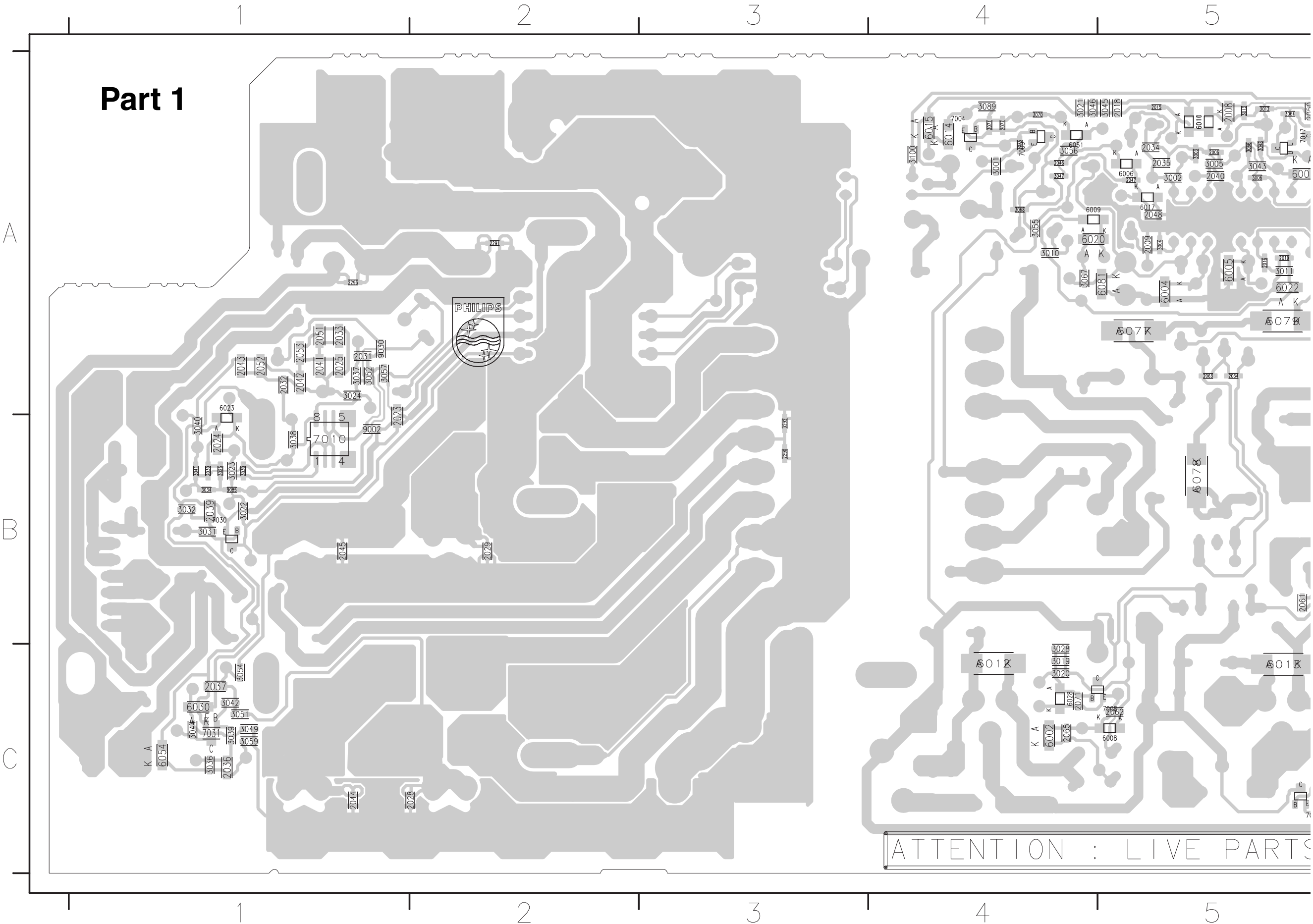


Layout Power Supply Unit (30-32 Inch) (Overview Bottom Side)

2006	A5	2018	A5	2027	A6	2033	A1	2040	A5	2046	A4	2053	A1	2065	C4	2293	A1	3004	A5	3010	A4	3020	C4	3027	A6	3034	B1	3040	B1	3046	A4	3054	C1	3064	A5	3071	A4	3802	B7	6002	C4	6008	C5	6014	A4	6027	C6	6078	B5	6155	A6	7009	A4	9002	B1	9810	B7
2007	A6	2019	A5	2028	C2	2034	A5	2041	A1	2047	A5	2060	C6	2071	C4	2802	B7	3005	A5	3011	A5	3021	A4	3028	C4	3035	C6	3041	B1	3047	A4	3055	A4	3065	A6	3075	A4	3803	B6	6003	C6	6009	A4	6015	A4	6028	C4	6079	A5	6460	A8	7010	A1	9008	A6		
2008	A5	2023	B1	2029	B2	2035	A5	2042	A1	2048	A5	2061	B5	2072	C5	2808	C7	3006	A5	3012	A5	3022	B1	3029	C6	3036	C1	3042	C1	3048	A5	3056	A4	3066	A5	3089	A4	3804	B7	6004	A5	6010	A5	6017	A5	6030	C1	6080	A6	6461	A8	7017	A5	9009	A6		
2009	A5	2024	B1	2030	B1	2036	C1	2043	A1	2050	A5	2062	C5	2077	A4	3001	A4	3007	A6	3013	A5	3023	B1	3030	B1	3037	A1	3043	A5	3049	C1	3057	A1	3067	A4	3100	A4	3806	B7	6005	A5	6011	A5	6020	A4	6051	A4	6081	A4	7004	A4	7018	A6	9030	A1		
2015	A5	2025	A1	2031	A1	2037	C1	2044	C1	2051	A1	2063	A5	2290	B3	3002	A5	3008	A6	3016	C6	3024	A1	3031	B1	3038	B1	3044	C1	3051	C1	3059	C1	3068	A4	3101	A6	3999	B8	6006	A5	6012	B4	6022	A5	6054	C1	6082	A6	7007	C5	7030	B1	9085	B1		
2016	A5	2026	A6	2032	A1	2039	B1	2045	B1	2052	A1	2064	A5	2291	A2	3003	A5	3009	A6	3019	C4	3025	B1	3032	B1	3039	C1	3045	A5	3052	A1	3061	A5	3070	A4	3292	B3	6001	A5	6007	B6	6013	C5	6023	A1	6077	A5	6154	A6	7008	C5	7031	C1	9806	B7		

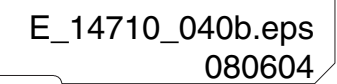


Layout Power Supply Unit (30-32 Inch) (Part 1 Bottom Side)

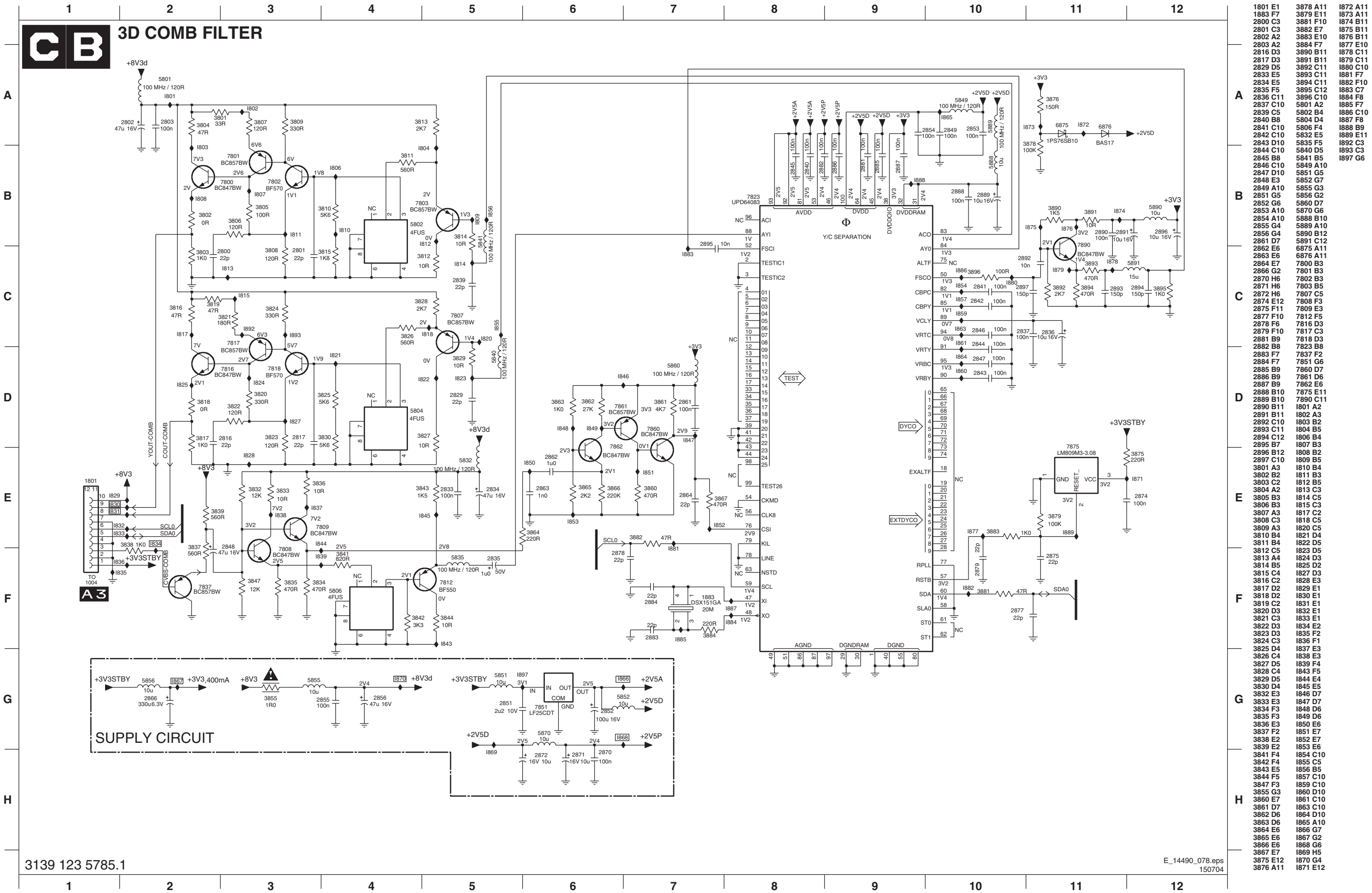


ATTENTION : LIVE PARTS

Part 2



3D Comb Filter



1



1



SIDE I/O

SVHS IN

YKF51-5564 0900

CVBS YKC21-5617 0901-A (YELLOW)

0901-B YKC21-5617 (WHITE)

LEFT

RIGHT

0901-C YKC21-5617 (RED)

Audio_in_gnd

Headph_gnd

HP-DETECT

YKB21-5101A

HEADPHONE

EH-B

FROM 1S36 OF B1

FROM 1336 OF A2

LC04

8204.000 6393.5 * RESERVED

E_14710_043.eps 210704

0900-A B1
0901-A B1
0901-B C2
0901-C C2
0902 E2
0936 A5
1000 F2
1001 F3
1002 E3
1003 D3
1004 C3
1005 B3
1006 B3
1007 A4
2901 A4
2902 B4
2903 C4
2904 D4
2905 F5
2906 F4
3901 A4
3902 A4
3903 A4
3904 B4
3905 B4
3906 C3
3907 C4
3908 D4
3909 D4
3910 E5
3911 F5
3912 F4
4901 B2
4902 A6
4903 C6

A

B

C

D

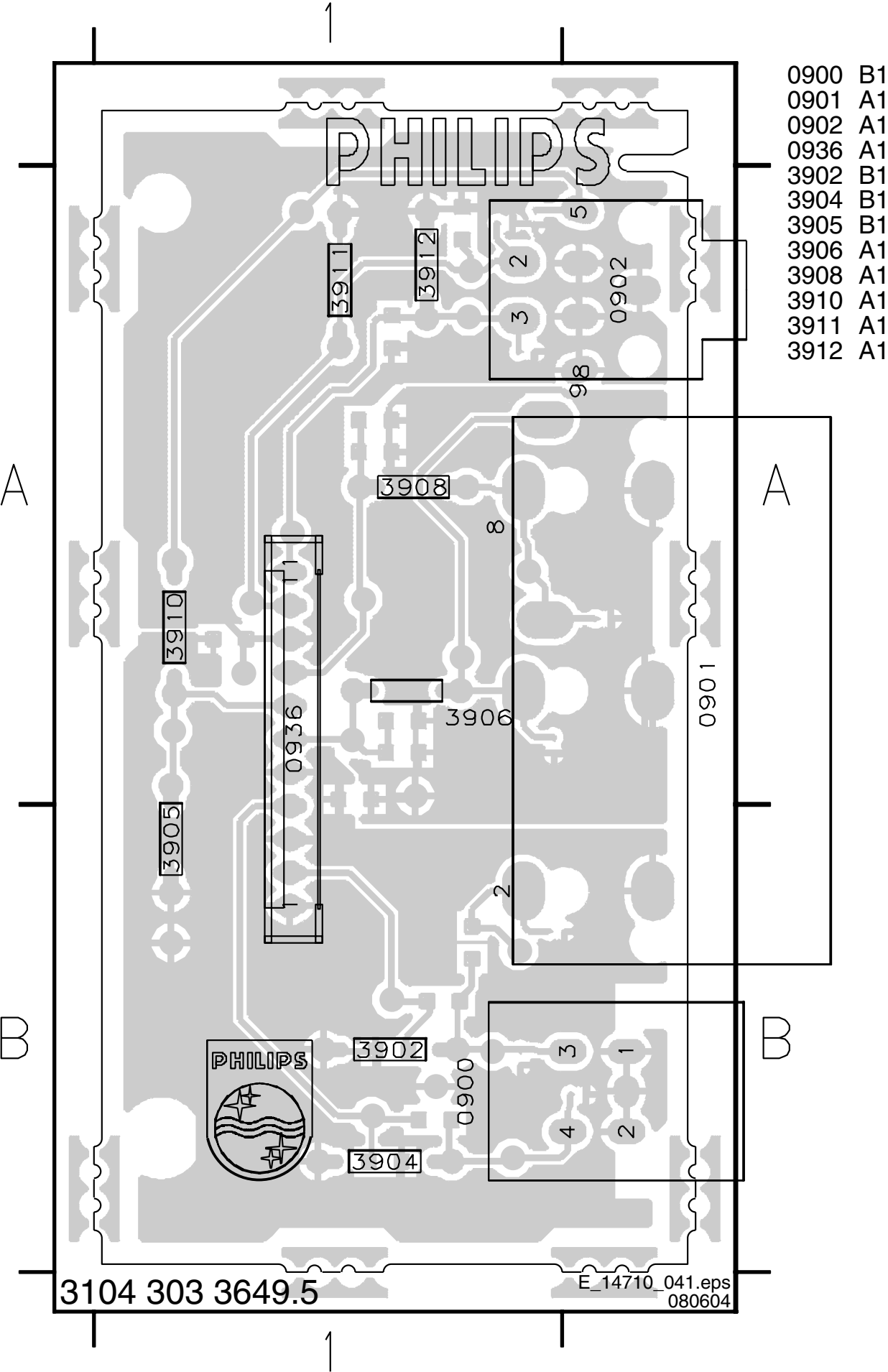
E

F

8204.000 6393.5 * RESERVED

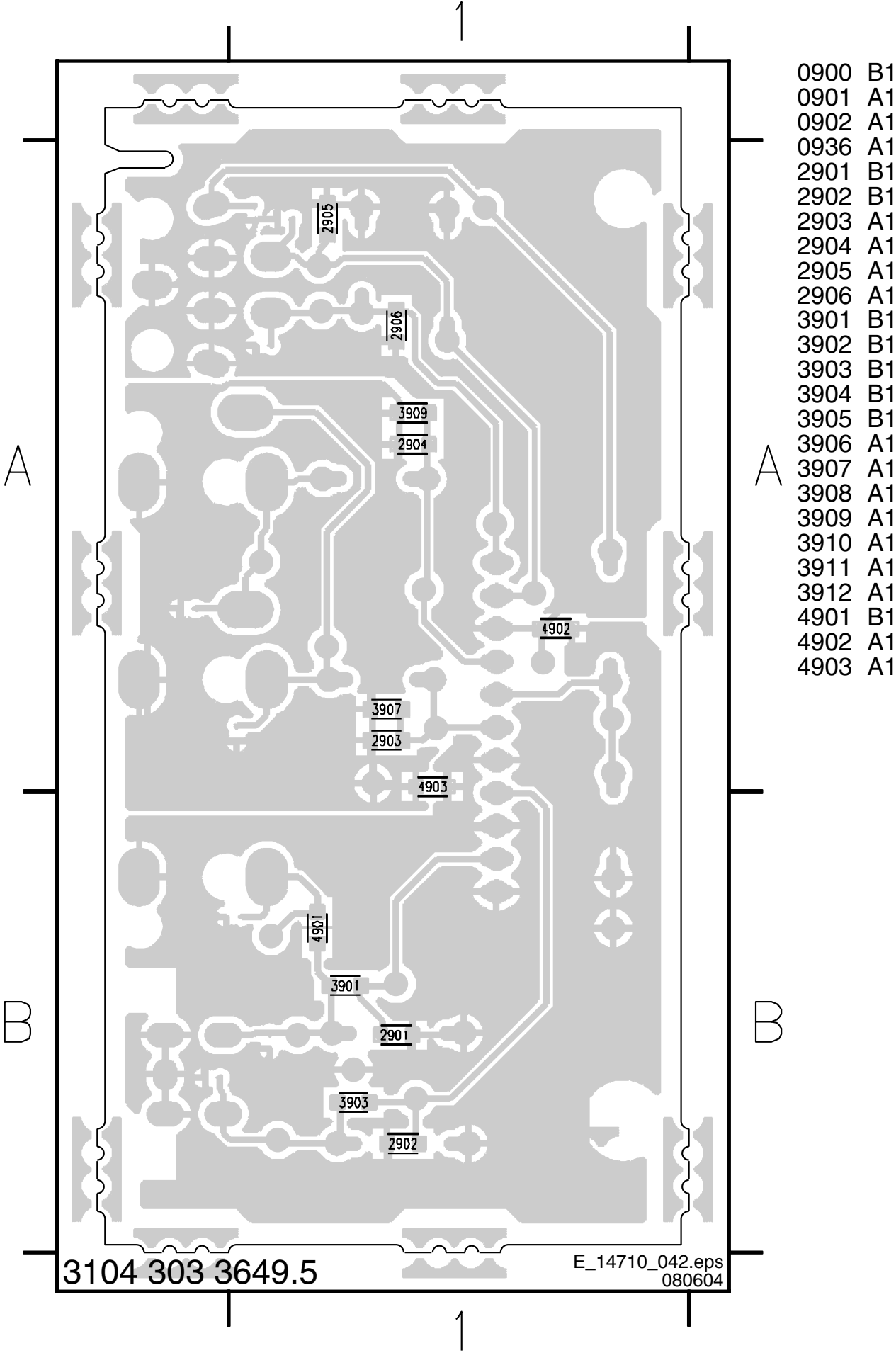
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210704

Layout Side I/O Panel (Top Side)



- 0900 B1
- 0901 A1
- 0902 A1
- 0936 A1
- 3902 B1
- 3904 B1
- 3905 B1
- 3906 A1
- 3908 A1
- 3910 A1
- 3911 A1
- 3912 A1

Layout Side I/O Panel (Bottom Side)



- 0900 B1
- 0901 A1
- 0902 A1
- 0936 A1
- 2901 B1
- 2902 B1
- 2903 A1
- 2904 A1
- 2905 A1
- 2906 A1
- 3901 B1
- 3902 B1
- 3903 B1
- 3904 B1
- 3905 B1
- 3906 A1
- 3907 A1
- 3908 A1
- 3909 A1
- 3910 A1
- 3911 A1
- 3912 A1
- 4901 B1
- 4902 A1
- 4903 A1

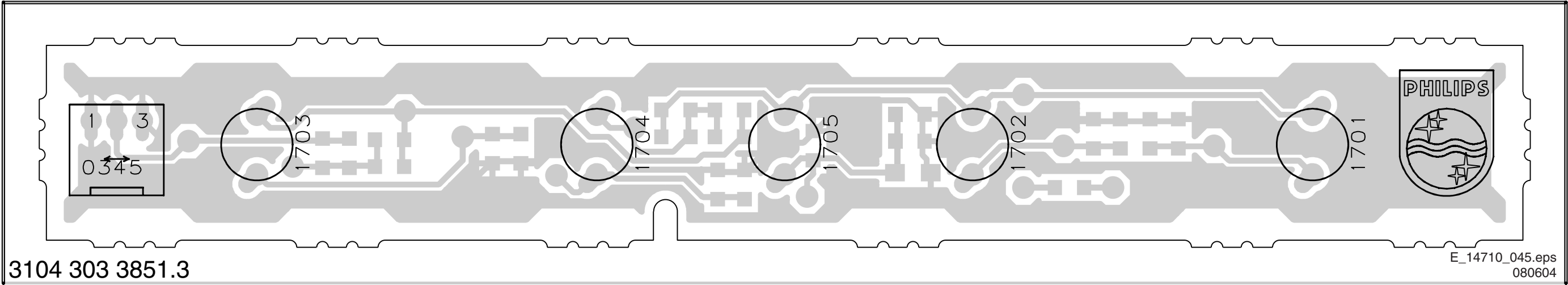
0345 A4	1704 D3	3003 E1	3007 E2	3011 E3	6005 E2	9004 E3	F702 D4	I704 D2	I708 E1
1701 D1	1705 D2	3004 E1	3008 D2	3012 C3	9001 D2	9005 C3	I701 C3	I705 E3	I709 E1
1702 D1	3001 E1	3005 E2	3009 E3	3013 C3	9002 E3	9006 C3	I702 D3	I706 E3	I710 A3
1703 D3	3002 E1	3006 E2	3010 D3	3999 D4	9003 D3	F701 D4	I703 D3	I707 E2	



This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

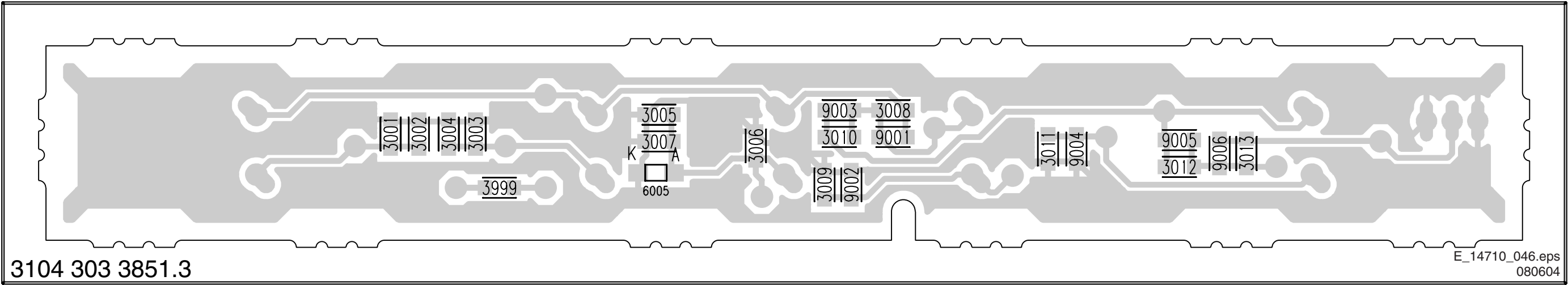
Layout Top Control Panel (Top Side)

0345 1701 1702 1703 1704 1705



Layout Top Control Panel (Top Side)

3001 3003 3005 3007 3009 3011 3013 6005 9002 9004 9006
3002 3004 3006 3008 3010 3012 3999 9001 9003 9005



J LED PANEL DISPLAY

FROM 1320 (LCD) OR TO 1345 (PDP) LC04

EMC

PH-S

ON / OFF SWITCH

SHIELDING 3.3

LED_DISPLAY F115 0317 1

IR_TX F116 2

GREEN_LED F117 3

RED_LED F118 4

IR_RX F119 5

F120 6

95009

4107

3107 470R

+5V_STBY_SW

3108 10K

100R

I109

4108

4110

I111

2107 100u

I112

4109

4111

I113

VS

CTRL CIRCUIT

INP

OUT

DEM

BAND PASS

AGC

PIN

GND

7107 TSOP2236

3101 150R

I102

6101

I103

3102 100K

7103 BC857BW

F110

3103 220R

I104

6103-A TLMV3100

2

1

GREEN

7105 BC857BW

F111

3105 330R

I105

6103-B TLMV3100

4

3

RED

3104 100K

I106

6105

BZX384-C3V9

I107

3106 150R

3120 4K7

7120-B LM358D

8

5

6

4

3121 4K7

I120

3123 10K

I123

3124 1K

3125 3K3

I125

3126 470K

I126

220n

6127

TEMPD5000

3127 470K

I127

3128 1K0

F121

F122

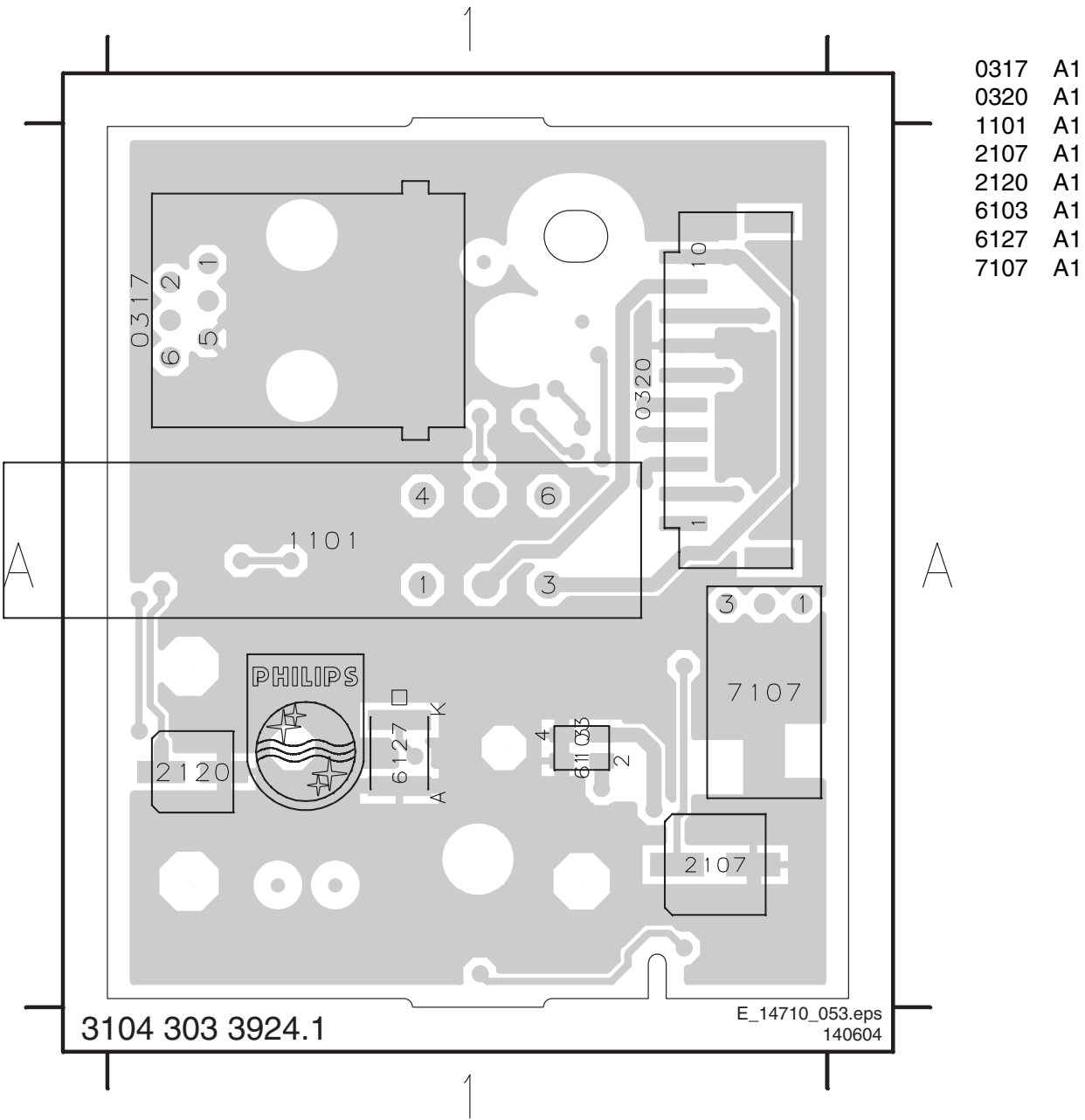
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E_14710_052.ep 210704

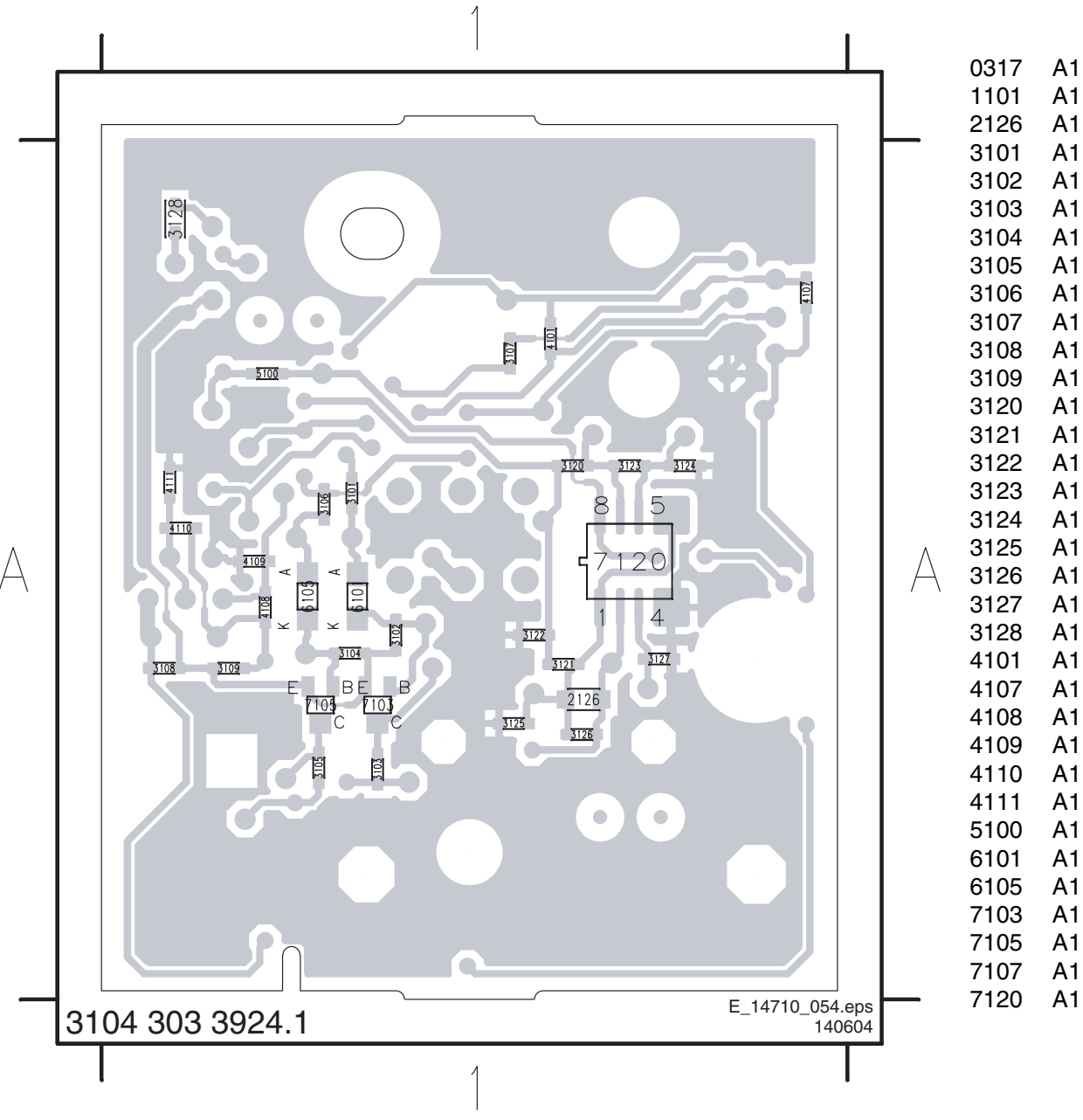
E_14710_052.eps
210704

0222 E2
0317 A9
0320 B1
1101 D3
2107 C7
2120 E5
2126 F6
3101 C4
3102 B4
3103 C5
3104 B6
3105 C5
3106 D6
3107 B5
3108 B7
3109 B7
3120 E4
3121 F4
3122 F3
3123 F4
3124 F5
3125 F5
3126 F6
3127 F6
3128 E8
4101 C3
4107 B6
4108 C8
4109 C8
4110 C8
4111 C8
5100 C2
6101 C4
6103-A D5
6103-B D5
6105 C6
6127 F6
7103 B5
7105 C5
7107 C9
7120-A E5
7120-B E4
F101 C2
F102 C2
F103 C2
F104 C2
F105 C2
F106 C1
F107 C1
F108 C2
F109 D2
F110 C5
F111 C6
F112 D2
F115 A9
F116 A9
F119 B9
F120 B9
F121 E8
F122 E9
I102 C4
I103 C4
I104 C5
I105 C5
I106 C6
I107 C6
I109 B7
I111 C7
I112 C8
I113 C8
I120 F4
I123 F5
I125 F5
I126 F6
I127 E6

Layout LED and Switch Panel (Top Side)



Layout LED and Switch Panel (Bottom Side)



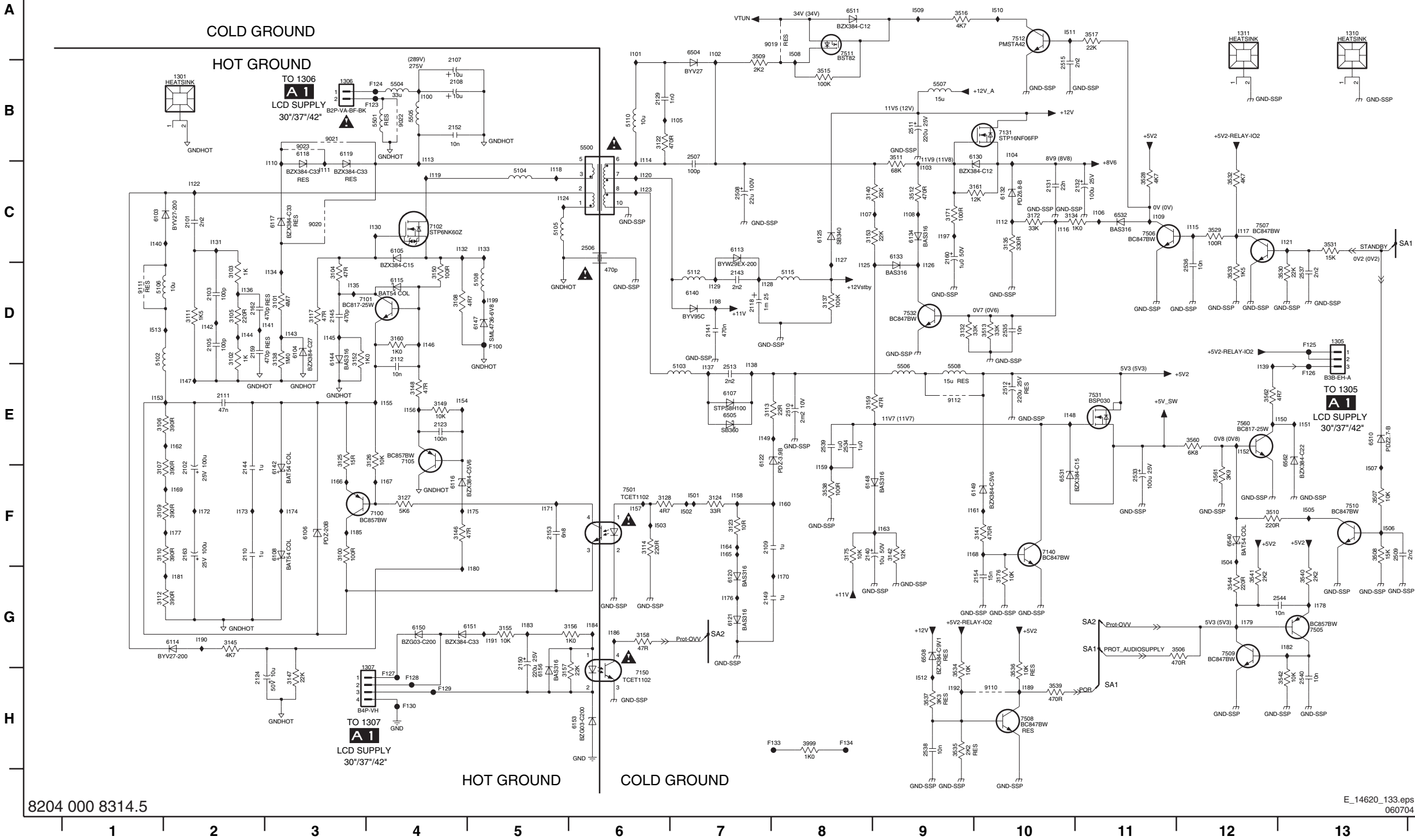
LCD Standby Audio Panel: Standby

SA2

STANDBY

Caution: Both $\downarrow$ and $\perp$ symbols can indicate a HOT ground in this schematic!

SA2



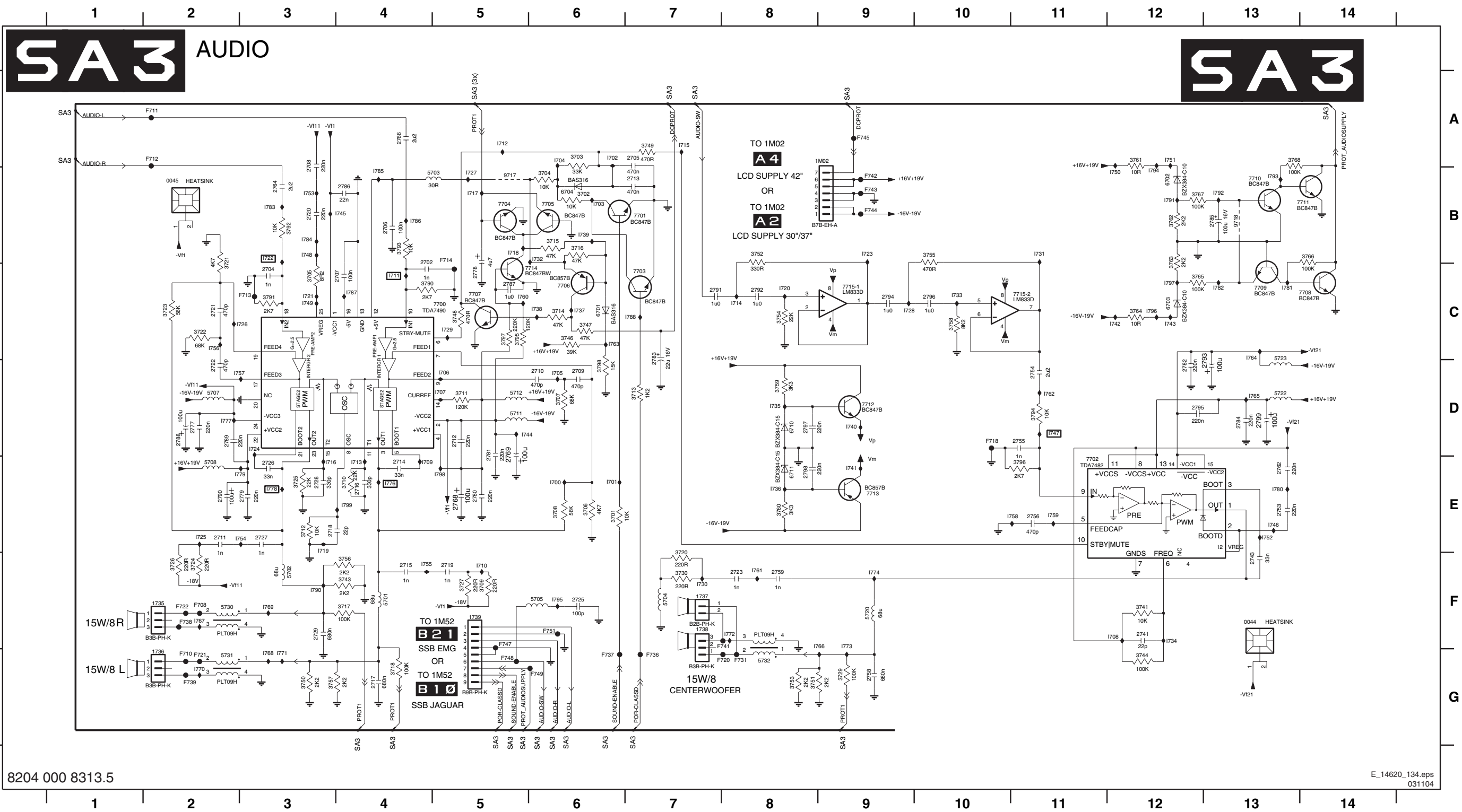
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060704

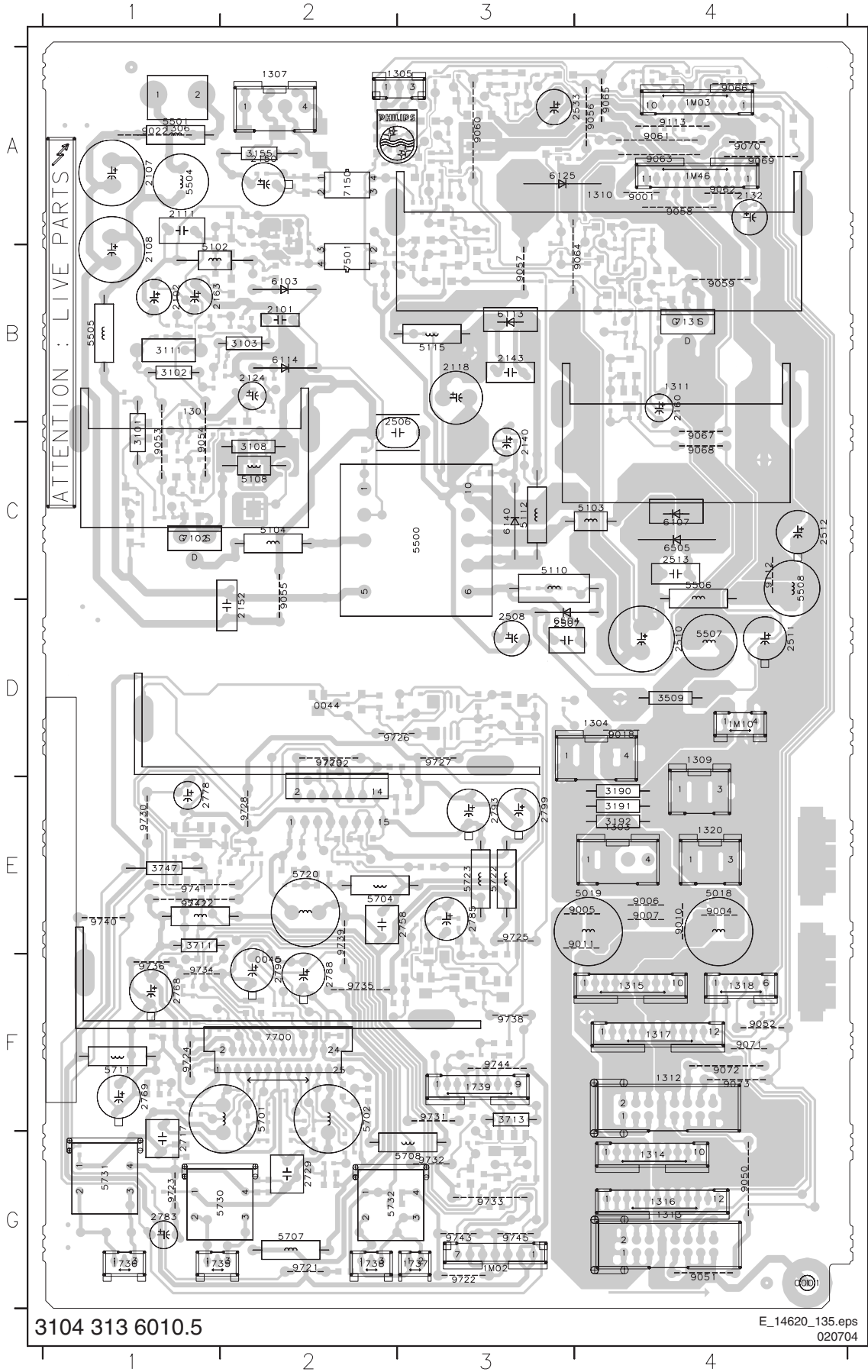
1301 B2	3508 F13	9021 B3	I191 G5
1305 D13	3509 A7	9022 B4	I192 H9
1306 B3	3510 F12	9023 B3	I197 C9
1307 H4	3511 B9	9110 H10	I198 D7
1310 A13	3512 C9	9111 D1	I199 D5
1311 A12	3513 D10	9112 E9	I501 F7
2101 C2	3515 B8	F100 D5	I502 F7
2102 F2	3516 A9	F123 B4	I503 F6
2103 D2	3517 A11	F124 B4	I504 F12
2105 D2	3528 C11	F125 D13	I505 F13
2107 A4	3529 C12	F126 E13	I506 F13
2108 B4	3530 D13	F127 H4	I507 F13
2109 F7	3531 C13	F128 H4	I508 A8
2110 F2	3532 C12	F129 H4	I509 A9
2111 E2	3533 D12	F130 H4	I510 A10
2112 D4	3534 H9	F133 H8	I511 A10
2118 D7	3535 H9	F134 H8	I512 H9
2123 E4	3536 H10	I100 B4	I513 D1
2124 H2	3537 H9	I101 A6	
2129 B6	3538 F8	I102 A7	
2131 C10	3539 H10	I103 C9	
2132 C11	3540 G13	I104 B10	
2140 F8	3541 G12	I105 B7	
2141 D7	3542 H13	I106 C11	
2143 D7	3544 G12	I107 C8	
2144 F2	3560 E12	I108 C9	
2145 D3	3561 F12	I109 C11	
2149 G7	3562 E12	I110 C3	
2150 G5	3999 H8	I111 C3	
2152 B4	5102 D1	I112 C10	
2153 F5	5103 E7	I113 B4	
2154 G10	5104 C5	I114 B6	
2159 D2	5105 C5	I115 C12	
2160 C9	5106 D1	I116 C10	
2162 D2	5108 D5	I117 C12	
2163 F2	5110 B6	I118 C5	
2506 C6	5112 D7	I119 C4	
2507 B7	5115 D8	I120 C6	
2508 C7	5500 B6	I21 C13	
2509 F13	5501 B4	I22 C2	
2510 E8	5504 B4	I23 C6	
2511 B9	5505 B4	I24 C5	
2512 E10	5506 E9	I25 D8	
2513 E7	5507 B9	I26 D9	
2515 B10	5508 E9	I27 C8	
2533 F11	6103 C1	I28 D7	
2534 E8	6104 D3	I29 D7	
2535 D10	6105 C4	I30 C4	
2536 D12	6106 F3	I31 C2	
2537 D13	6107 E7	I32 C4	
2538 H9	6108 F3	I33 C5	
2539 E8	6113 C7	I34 D3	
2540 H13	6114 G2	I35 D3	
2544 G13	6115 D4	I36 D2	
3100 F3	6116 F4	I37 E7	
3101 D3	6117 C3	I38 E7	
3102 D2	6118 B3	I39 E12	
3103 D2	6119 B3	I40 C1	
3104 D3	6120 G7	I41 D3	
3105 D2	6121 G7	I42 D2	
3106 E1	6122 E7	I43 D3	
3107 F1	6125 C8	I44 D2	
3108 D4	6130 B10	I45 D3	
3109 F1	6132 C10	I46 D4	
3110 F1	6133 C9	I47 E2	
3111 D2	6134 C9	I48 E10	
3112 G1	6140 D7	I49 E7	
3113 E7	6142 F3	I50 E13	
3114 F6	6144 D3	I51 E13	
3117 D3	6147 D5	I52 E12	
3122 B6	6148 F8	I53 E1	
3123 F7	6149 F9	I54 E4	
3124 F7	6150 G4	I55 E4	
3125 E3	6151 G5	I56 E4	
3126 E4	6153 H6	I57 F6	
3127 F4	6156 H5	I58 F7	
3128 F6	6504 A7	I59 F8	
3132 D9	6505 E7	I60 F8	
3134 C10	6508 G9	I61 F9	
3135 C10	6510 E13	I62 E2	
3137 D8	6511 A8	I63 F9	
3138 D3	6531 F10	I64 F7	
3140 C8	6532 C11	I65 F7	
3141 F10	6540 F12	I66 F3	
3142 F9	6562 E13	I67 F4	
3145 G2	7100 F4	I68 F9	
3146 F4	7101 D4	I69 F2	
3147 H3	7102 C4	I70 G8	
3148 E4	7105 E4	I71 F5	
3149 E4	7131 B10	I72 F2	
3150 D4	7140 F10	I73 F2	
3152 D3	7150 H6	I74 F3	
3153 C8	7501 F6	I75 F5	
3155 G5	7505 G13	I76 G7	
3156 G6	7506 C11	I77 F2	
3157 H5	7507 C12	I78 G13	
3158 G6	7508 H10	I79 G12	
3159 E8	7509 G12	I80 G5	
3160 D4	7510 F13	I81 G2	
3161 C10	7511 A8	I82 G13	
3171 C9	7512 A10	I83 G5	
3172 C10	7531 E11	I84 G6	
3175 F8	7532 D9	I85 F3	
3176 G10	7560 E12	I86 G6	
3506 G12	9019 A8	I89 H10	
3507 F13	9020 C3	I90 G2	

LCD Standby Audio Panel: Audio

0044 F13	2705 A7	2715 F4	2726 E3	2758 G9	2780 E5	2790 E2	3701 E6	3711 D5	3722 C2	3744 G12	3755 B10	3765 C12	3796 E11	5711 D5	6703 C12	7706 C6	7715-2 C11	F720 G8	F743 B9	I703 B6	I713 E4	I723 B9	I733 C10	I743 C12	I753 B3	I763 C6	I773 F9	I784 B3	I795 F6
0045 B2	2706 B4	2716 E4	2727 E3	2759 F8	2781 D5	2791 C7	3702 B6	3712 D3	3723 C2	3746 C6	3756 F4	3766 B14	3797 C5	5712 D5	6704 B6	7707 C5	9717 B5	F721 G2	F744 B9	I704 A6	I714 C8	I724 D3	I734 F12	I744 D5	I754 E3	I764 C13	I774 F9	I785 B4	I796 C12
1735 F2	2707 C4	2717 G4	2728 E3	2762 E13	2782 D12	2792 C8	3703 A6	3713 D7	3724 F2	3747 C6	3757 C3	3767 B13	3798 D6	5720 F9	6710 D8	7708 C13	9718 B13	F722 F2	F745 A9	I705 D6	I715 A7	I725 E2	I735 D8	I745 B4	I755 F4	I765 D13	I776 E4	I786 B4	I797 C12
1736 G2	2708 A3	2718 E3	2729 F3	2764 B3	2783 C7	2793 D13	3704 B6	3714 C6	3725 E3	3748 C5	3758 C10	3768 A13	3799 F4	5721 D13	6711 E8	7709 C13	9719 B13	F723 F2	F746 A9	I706 D5	I716 E3	I726 C3	I736 E8	I746 E13	I756 C2	I766 F9	I777 D2	I787 C4	I798 E5
1737 F7	2709 D6	2719 F5	2741 F12	2766 A4	2784 D13	2794 C9	3705 C3	3715 B6	3726 F2	3749 A7	3759 D8	3790 C4	3792 F3	5722 D13	6700 C5	7710 B13	9720 G2	F724 G2	F747 F5	I707 D5	I717 B5	I727 B5	I737 C6	I747 D11	I757 D2	I767 F2	I778 E3	I788 C7	I799 E4
1738 F7	2710 D6	2720 B3	2743 F13	2768 E5	2785 B13	2795 D12	3706 E6	3716 B6	3727 F5	3750 G3	3760 E8	3791 C3	3793 B5	5730 F2	6701 B7	7711 B13	9721 G2	F725 G2	F748 G5	I708 F12	I718 B5	I728 C9	I738 C6	I748 C3	I758 E11	I768 G3	I779 E3	I789 F3	I790 F3
1739 F5	2711 E2	2721 C2	2753 E13	2769 D5	2786 B4	2796 C10	3707 D6	3717 F4	3729 G9	3751 G3	3761 A12	3792 B3	3794 F7	5731 G2	6702 E11	7712 D2	9722 G2	F726 F2	F749 G6	I709 E4	I719 E3	I729 C5	I739 B6	I749 D9	I759 E11	I769 F3	I770 G2	I780 E13	I791 B12
1M02 A9	2712 D5	2722 D2	2754 D11	2777 D2	2787 C5	2797 D8	3708 E6	3718 G4	3730 F7	3752 B8	3762 B12	3793 B4	3795 F6	5732 G8	6703 C7	7713 E9	9723 G2	F727 G2	F750 E6	I710 F5	I720 C8	I730 F7	I740 D9	I750 B12	I760 C5	I770 G2	I781 C13	I792 B13	I793 B13
2702 C4	2713 B7	2723 F8	2755 D11	2778 C5	2788 D2	2798 E8	3709 F5	3720 F7	3741 F12	3753 G8	3763 B12	3794 D11	3797 D2	5707 D2	6701 C6	7704 B5	9724 C5	F728 F2	F751 F6	I711 C4	I721 C3	I731 B11	I741 E9	I751 A12	I761 F8	I771 G3	I782 C13	I793 B13	I794 B12
2704 C3	2714 E4	2725 F6	2756 E11	2779 E3	2789 D2	2799 D13	3710 E4	3721 B2	3743 F4	3754 C8	3764 C12	3795 C5	5708 E2	6702 B12	7705 B6	9725 C5	F729 F2	F752 B8	I712 A5	I722 B3	I732 B6	I742 C12	I752 E13	I762 D11	I772 F8	I783 B3	I794 B12	I795 E4	I796 C12

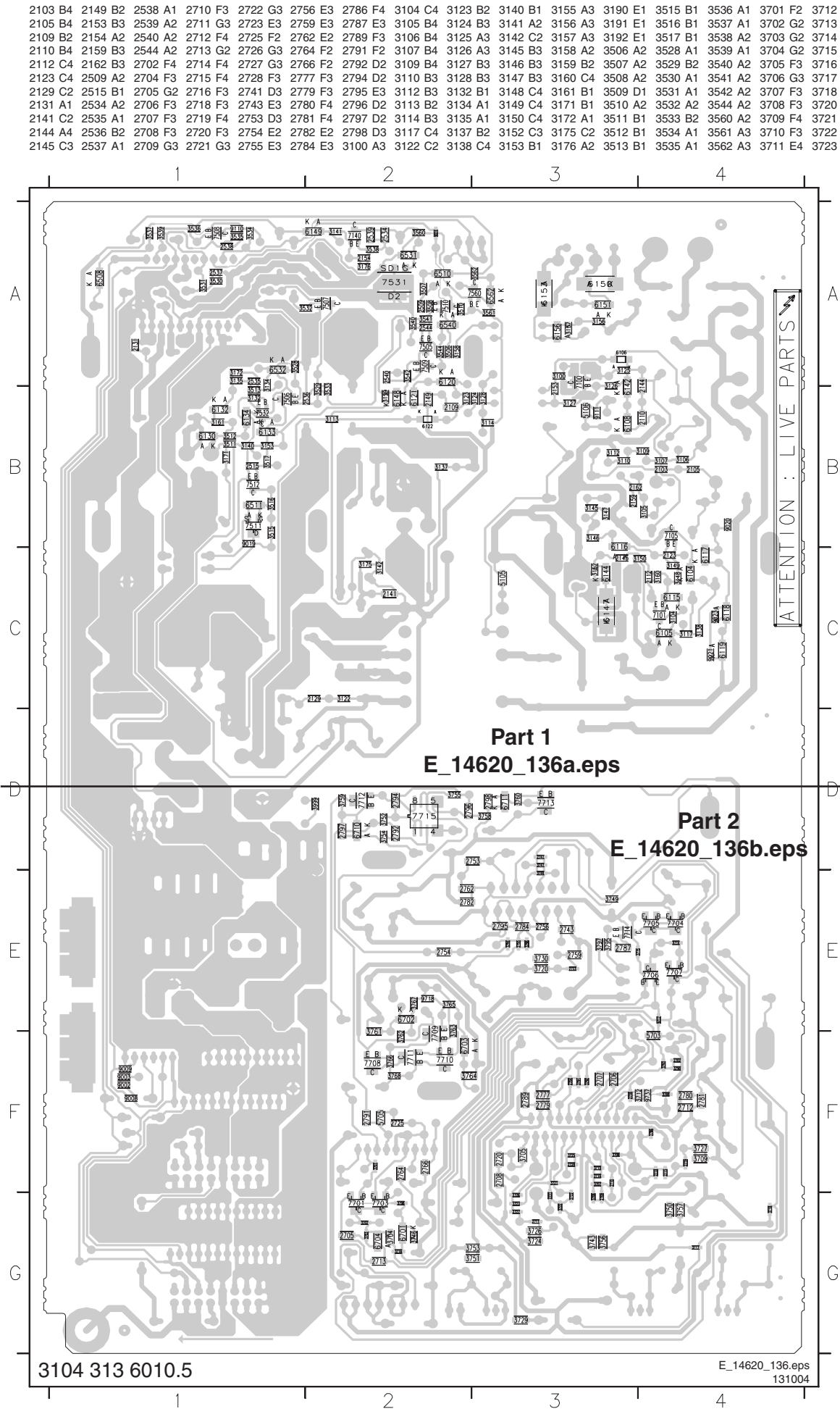


Layout LCD Standby Audio Panel (Top Side)

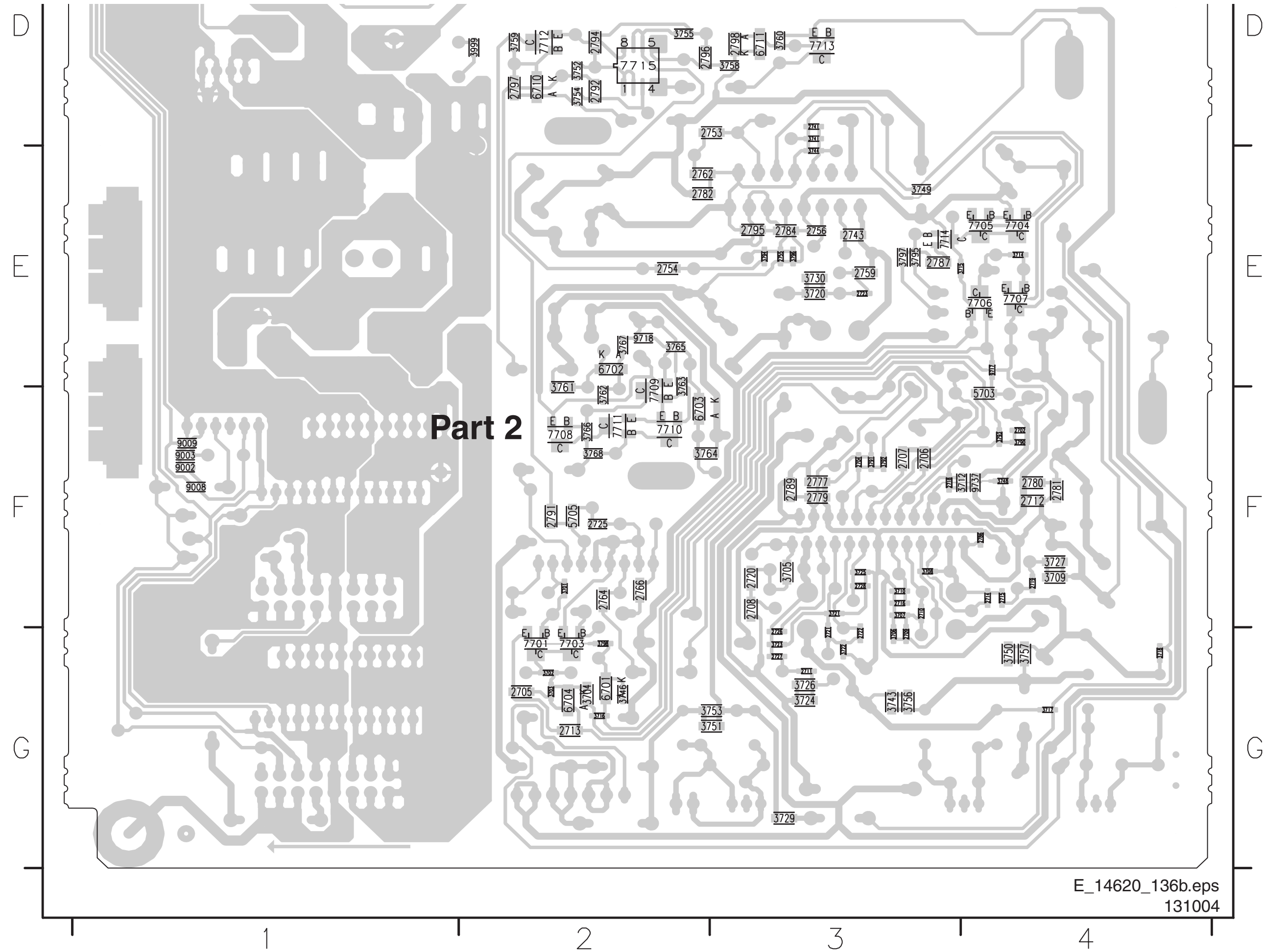


0001 G4	5507 D4
0044 D1	5508 C4
0045 E1	5701 F2
1301 B1	5702 F2
1303 E4	5704 E2
1304 D4	5707 G2
1305 A3	5708 G3
1306 A1	5711 F1
1307 A2	5712 E1
1309 D4	5720 E2
1310 A3	5722 E3
1311 B4	5723 E3
1312 F4	5730 G2
1313 G4	5731 G1
1314 G4	5732 G3
1315 F4	6103 B2
1316 G4	6107 C4
1317 F4	6113 B3
1318 F4	6114 B2
1320 E4	6125 A3
1735 G1	6140 C3
1736 G1	6504 D3
1737 G3	6505 C4
1738 G2	7102 C1
1739 F3	7131 B4
1M02 G3	7150 A2
1M03 A4	7501 B2
1M10 D4	7700 F2
1M46 A4	7702 E3
2101 B2	9001 A4
2102 B1	9004 E4
2107 A1	9005 E4
2108 A1	9006 E4
2111 A1	9007 E4
2118 B3	9010 E4
2124 B2	9011 E4
2132 A4	9018 D4
2140 C3	9022 A1
2143 B3	9050 G4
2150 A2	9051 G4
2152 D2	9052 F4
2160 B4	9053 B1
2163 B1	9054 B1
2506 B2	9055 C2
2507 D3	9056 A4
2508 D3	9057 A3
2510 D4	9058 A4
2511 D4	9059 B4
2512 C4	9060 A3
2513 C4	9061 A4
2533 A4	9062 A4
2717 F1	9063 A4
2729 G2	9064 A3
2758 E3	9065 A4
2768 F1	9066 A4
2769 F1	9067 C4
2778 E1	9068 C4
2783 G1	9069 A4
2785 E3	9070 A4
2788 F2	9071 F4
2790 E2	9072 F4
2793 E3	9073 F4
2799 E3	9112 C4
3101 B1	9113 A4
3102 B1	9721 G2
3103 B2	9722 G3
3108 C2	9723 G1
3111 B1	9724 F1
3155 A2	9725 E3
3190 E3	9726 D2
3191 E3	9727 D3
3192 E3	9728 E2
3509 D4	9729 D2
3711 F1	9730 E1
3713 F3	9731 F3
3747 E1	9732 G3
5018 E4	9733 G3
5019 E4	9734 F1
5102 B2	9735 F3
5103 C4	9736 F1
5104 C2	9738 F3
5108 C1	9739 F2
5110 C3	9740 E1
5112 C3	9741 E1
5115 B3	9742 E1
5500 C3	9743 G3
5501 A1	9744 F3
5504 A1	9745 G3
5505 B1	
5506 C4	

Layout LCD Standby Audio Panel (Overview Bottom Side)



Layout LCD Standby Audio Panel (Part 2 Bottom Side)



This image shows a full page of blank, lined paper. It features approximately 30 evenly spaced horizontal blue or grey lines across the entire width of the page. The lines are thin and consistent in color and thickness. There are no margins, text, or other markings present on the paper.

8. Alignments

Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware Alignments
- 8.3 Software Alignments

Note: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the CURSOR UP, DOWN, LEFT or RIGHT keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage (depends on region):
 - AP-NTSC: 120 V_{AC} or 230 V_{AC} / 50 Hz (± 10%).
 - AP-PAL-multi: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - EU: 230 V_{AC} / 50 Hz (± 10%).
 - LATAM-NTSC: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - US: 120 V_{AC} / 60 Hz (± 10%).
 - Connect the set to the AC Power via an isolation transformer with low internal resistance.
 - Allow the set to warm up for approximately 15 minutes.
 - Measure voltages and waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply).
- Caution:** It is not allowed to use heatsinks as ground.
- Test probe: R_i > 10 Mohm, C_i < 20 pF.
 - Use an isolated trimmer/screwdriver to perform alignments.

8.1.1 Initial Settings

Perform all electrical adjustments with the following initial settings:

1. To avoid the working of the lightsensor, set "Active Control" to "Off" (via the "Active Control" button on the RC).
2. Set "Smart Picture" to "Natural" or "Soft" (via the "Smart Picture" button on the RC).

8.1.2 Alignment Sequence

- First, set the correct options:
 - In SAM, select OPTIONS,
 - Fill in the option settings according to the set sticker (see also paragraph "Option Settings"),
 - Store the OPTIONS by switching the set to STAND-BY.
- Warming up (>15 minutes).
- White-D alignment.

8.2 Hardware Alignments

8.2.1 Backlight Voltage Alignment

Switch the set "on" and measure the voltage between pin 3 (or 4) of connector 1304 (on MF panel) and ground. Align R3026 until this voltage is 12.2 V_{DC} +/- 0.1 V.

Caution: This voltage must be aligned very precisely (within 1%): when it is too high, it can destroy the inverters. When it is too low, the backlight will not start up.

8.3 Software Alignments

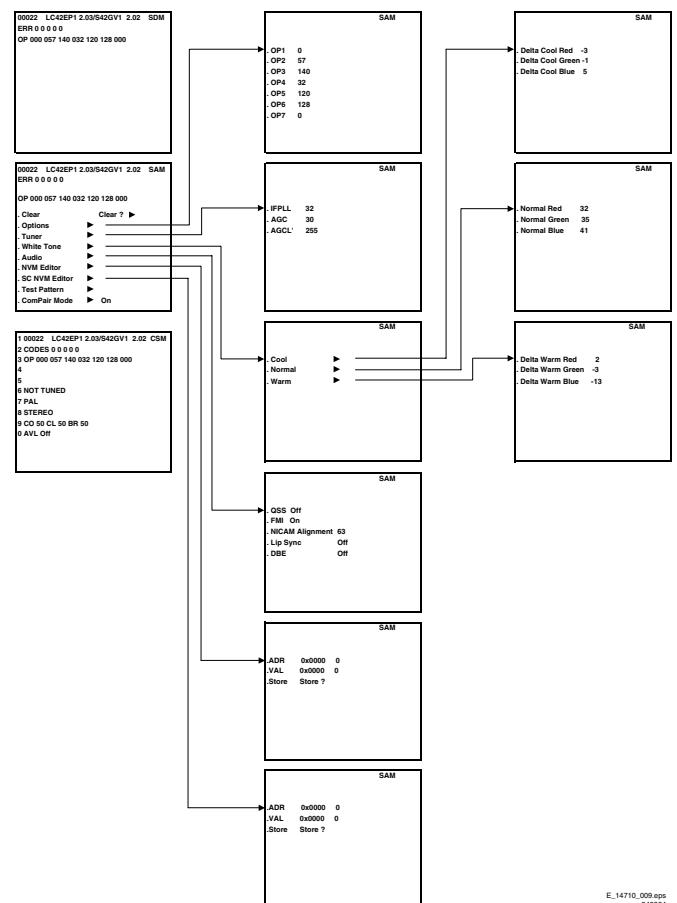
With the software alignments of the Service Alignment Mode (SAM), Options can be set and the WHITE TONE, TUNER (IF) and AUDIO settings can be aligned.

To store the data: Use the RC button MENU to switch to the main menu and then switch to STAND-BY mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **EU/AP-PAL** models: a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC** models: an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **LATAM** models: an NTSC M or PAL M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).

8.3.1 SAM Menu



E_14710_009 app
240654

Figure 8-1 Overview SAM menu (example from EU set).

8.3.2 White Tone

Method 1 (with color analyzer):

1. Supply a 100% white uniformity test signal (100 IRE white) to the tuner.
2. Enter SAM menu (color features are switched "off" automatically).
3. Do NOT change the SMART PICTURE, ACTIVE CONTROL, and CONTRAST+ settings to prevent activating of Green Enhancement, Blue Stretch, and Black Stretch.

Offset values in NVM are used for HD-, HDMI-, and VGA mode, therefore only the settings in TV mode need to be set.

Make the following settings in the normal **user menu**, when the television is in TV Mode:

Table 8-1 User menu settings for White Tone alignment

	LCD (AUO)	LCD (LPL)	Plasma (SDI)
CONTRAST	99		
BRIGHTNESS	42 (EU) 44 (US)	46	46 (AP+EU) 48 (US+LA)
COLOR/SAT.	50 (AP+LA+US) 60 (EU)		

Go to WHITE TONE in SAM and set NORMAL GREEN to:

Table 8-2 Service menu settings for White Tone alignment

	LCD (AUO)	LCD (LPL)	Plasma (SDI)
NORMAL GREEN	200		180

1. Measure with a calibrated (phosphor- independent) color analyzer (e.g. Minolta CA-200) in the center of the screen (use a contact less analyzer, e.g. Minolta CA-210, to align the LCD TV). The analyzer may not touch the screen, and the measurement must be done in a dark environment. Note: The color analyzer must be calibrated for the LCD or Plasma panel in question. See the manual of the color analyzer for the procedure on how to perform this calibration.

2. Leave the value with the lowest output on the initial value.
3. Align the NORMAL white points, by lowering the other two colors, to the right x-y coordinates (see table "White Tone alignment values").

Note: To prevent clipping of the color, these values must only be lowered!

Table 8-3 White Tone alignment values

	NORMAL color temp. (all regions)
X	0.289
Y	0.299

Only the values for NORMAL are aligned with X, Y values. The delta values for COOL and WARM are given below.

Table 8-4 Fixed delta values

Screen Type	Color temp.	RED	GREEN	BLUE
LCD (AUO)	DELTA COOL	-3	-12	+10
	DELTA WARM	+5	-5	-20
LCD (LPL)	DELTA COOL	-8	-12	+3
	DELTA WARM	+2	-10	-21
Plasma	DELTA COOL	-6	-10	+5
	DELTA WARM	+4	-5	-19

After the alignment is finished, switch the set to STANDBY, in order to store the alignments.

Note: When disconnecting the power before doing this, the settings will not be stored.

Method 2 (without color analyzer):

If you do not have a color analyzer, you can use the default values. These values are based on the average values in production.

- Set the values for the NORMAL color temperature. Given in the table "Average statistical values for NORMAL" from production.

- Set the delta values for the COOL and WARM mode. See table: "Fixed delta values."

After the alignment is finished, switch the set to STANDBY, in order to store the alignments.

Note: When disconnecting the power before doing this, the settings will not be stored.

Table 8-5 Average statistical values for "NORMAL"

Display type	Colour Temp.	RED	GREEN	BLUE
LCD (AUO)	NORMAL	165	182	200
LCD (LPL)	NORMAL	200	195	190
Plasma 37" (SDI)	NORMAL	174	180	178
Plasma 42" (SDI)	NORMAL	173	180	172
Note: Values are valid for all regions				

8.3.3 Tuner Adjustment

AGC (RF AGC Take Over Point)

Set pattern generator (e.g. PM5580) with color bar pattern and connect to aerial input with RF signal amplitude -10mV and set frequency for NTSC to 61.25 MHz (channel 3).

- Activate the SAM-menu. Go to the sub-menu TUNER, select the sub-menu option AFC WINDOW and adjust the value to "100 kHz".
- Select the AGC sub-menu.
- Connect a DC multi-meter to test point F306 or pin1 of the tuner.
- Adjust the AGC until the voltage at pin 1 of the tuner is 3.3 V +0.5 / -1.0.
- The value can be increased or decreased by pressing the RIGHT/LEFT cursor button on the RC.
- Switch the set to STAND-BY to store the data.

8.3.4 Grey Scale Adjustment

SDTV Grey Scale Adjustment

Equipment and setting

- E.g. Fluke 54200 or Philips PM5580.
- 100% "8-step grey scale" pattern.

Alignment Method

- Switch with the RC to TV mode,
- Press the MUTE button on RC,
- Set SMART PICTURE to SOFT mode,
- Activate the auto color function by pressing key-sequence: INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO.

Expected Results

- Visual check if the 8 Grey levels are correct.

Analog PC Grey Scale Adjustment

Equipment and setting

- Quantum Data 802B.
- PC input signal, with 64 levels Grey scale pattern, 1024x768 @ 60Hz (Format= 81:DMT1060, Pattern= 123:Grey 64).
- PC input at D-sub VGA connector.

Alignment Method

- Switch with the RC to PC mode.
- Press the MUTE button on RC.
- Set BRIGHTNESS and CONTRAST to nominal "50".
- Activate the auto color function by pressing key-sequence: INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO.

Expected Results

- Visual check if the 64 Grey levels are correct.

HD Grey Scale Adjustment

Equipment and setting

- Quantum Data 802B.
- HD input signal, Top half 100% color bar and bottom half Grey scale pattern, 1920x1080i @ 60Hz YPbPr (Format= 1080i30, Pattern= HDBar100).
- HD input at D-sub VGA connector.

Alignment Method

- Switch with the RC to HD mode.
- Press the MUTE button on RC.
- Activate the auto color function by pressing key-sequence: INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO.

Expected Results

- Visual check if Color bar tint and Grey scale is correct.

8.3.5 Sound

No adjustments needed for sound.

8.3.6 Options

Options are used to control the presence/absence of certain features and hardware.

See for an overview, the table on the next page.

How to change an Option Byte

An Option Byte represents a number of different options. Changing these bytes directly makes it possible to set all options very fast. All options are controlled via seven option bytes. Select the option byte (OP1.. OP7) with the cursor UP/DOWN keys, and enter the new value.

Leaving the OPTION sub menu saves the changes in the Option Byte settings. Some changes will only take effect after the set has been switched "off" and "on" with the AC power switch (cold start).

Table 8-6 Option codes (general overview for all regions and displays)

Bit (DEC)	Option	Description	/78 (LATAM)	/61 (AP- NTSC)	/69,79,98 (AP-PAL)	/93 (China)	/10, /12 (Europe)	/17, /37 (NAFTA)	Remarks
7 (128)	OP_PHILIPS_TUNER	Philips Tuner available	1	1	1	1	1	1	
6 (64)	OP_FM_RADIO	FM Radio available	0	0	0	0	0	0	
5 (32)	OP_LNA	Low Noise Amplifier available	0	0	0	0	0	0	
4 (16)	OP_ATS	Auto Tuning System	0	0	0	0	1	0	
3 (8)	OP_ACI	ACI	0	0	0	0	1	0	
2 (4)	OP_UK_PNP	After virgin = English + Great Britain	0	0	0	0	0	0	
1 (2)	OP_VIRGIN_MODE	Activate Plug & Play menu at start-up	0	0	0	0	0	0	
0 (1)	OP_CHINA	AP-PAL tuning algorithm for China	0	0	0	1	0	0	
OP1:			128	128	128	129	152	128	
7 (128)	OP_SMART_SOUND	Four smart sound settings	1	1	1	1	1	1	
6 (64)	OP_UI_GREEN	UI for Magnavox sets (NAFTA)	0	0	0	0	0	0	
5 (32)	OP_CHANNEL_NAMING	Naming of channel feature available	1	1	1	1	0	1	
4 (16)	OP_LTI	Histogr. algorithm available (TDA9178)	1	1	1	1	1	1	
3 (8)	OP_TILT	Picture Rotation available	0	0	0	0	0	0	
2 (4)	OP_FINE_TUNING	Fine Tuning algorithm available	1	1	1	1	1	1	
1 (2)	OP_PIP_PHILIPS_TUNER	PIP Philips tuner	0	0	0	0	0	0	
0 (1)	OP_HUE	Tint for NTSC transmission	1	1	0	0	0	1	
OP2:			181	181	180	180	148	181	
7 (128)	OP_EW_FUNCTION	Geometry adj. for Large screen sets	0	0	0	0	0	0	
6 (64)	OP_2TUNER_PIP	Double Tuner for PIP available	0	0	0	0	0	0	
5 (32)	OP_PIP_SPLITTER	Not used	0	0	0	0	0	0	
4 (16)	OP_SPLITTER	Not used	0	0	0	0	0	0	
3 (8)	OP_VIRTUAL_DOLBY	Virtual Dolby Effect	1	1	1	1	1	1	
2 (4)	OP_WIDE_SCREEN	16:9 sets	1	1	1	1	1	1	
1 (2)	OP_WSSB	Wide Screen Signalling Bit detection	0	0	1	0	1	0	
0 (1)	OP_ECO_SUBWOOFER	Sub woofer available	0	0	0	0	0	0	
OP3:			12	12	14	12	14	12	
7 (128)	OP_LIP_SYNC	Lip Synchronisation Circuit available	0	0	0	0	0	0	Not for LCD
6 (64)	OP_NOTUSED2	Not used	0	0	0	0	0	0	
5 (32)	OP_ULTRA_BASS	Ultra Bass Boost available	0	0	0	0	0	0	
4 (16)	OP_DELTA_VOLUME	Delta Volume feature available	0	0	0	0	1	0	EU only
3 (8)	OP_NOTUSED3	Not used	0	0	0	0	0	0	
2 (4)	OP_NOTUSED4	Not used	0	0	0	0	0	0	
1 (2)	OP_STEREO_DBX	Stereo DBX for NTSC available	1	0	0	0	0	1	NTSC only
0 (1)	OP_STEREO_NICAM_2CS	Stereo NICAM 2CS available	0	0	1	0	1	0	
OP4:			2	0	1	0	17	2	
7 (128)	OP_AV1	External Source 1 available	1	1	1	1	1	1	
6 (64)	OP_AV2	External Source 2 available	1	1	1	1	1	1	
5 (32)	OP_AV3	External Source 3 (Side AV) available	1	1	1	1	1	1	
4 (16)	OP_CVI	Component Video In available	1	1	1	1	0	1	Not for EU
3 (8)	OP_SVHS2	Super Video Home System 2 available	1	0	0	0	0	0	
2 (4)	OP_SVHS3	Super Video Home System 3 available	1	0	0	0	0	0	
1 (2)	OP_HOTEL_MODE	LATAM specific simplified Hotel Mode	0	0	0	0	0	0	
0 (1)	OP_NOTUSED	Not used	0	0	0	0	0	0	
OP5:			252	240	240	240	224	240	
7 (128)	OP_PERSONAL_ZAPPING	Zapping of channels feature available	0	0	0	0	0	0	
6 (64)	OP_SMART_SURF	Surf List available	1	0	0	0	0	0	
5 (32)	OP_FMTRAP	FM trap available	0	0	0	0	0	0	
4 (16)	OP_COMBFILTER	comb filter available	1	1	1	1	1	1	In Hercules
3 (8)	OP_ACTIVE_CONTROL	Auto Picture Impr. feature available	1	1	1	1	1	1	
2 (4)	OP_SMART_LOCK	Toggle Child Lock & Lock Chan. enabled	1	1	1	1	1	1	
1 (2)	OP_LIGHT_SENSOR	Light Sensor enabled	1	1	1	1	1	1	
0 (1)	OP_TWIN_TEXT	2 txt pages on screen available	0	0	1	1	1	0	
OP6:			94	30	31	31	31	30	
7 (128)	OP_TIME_WIN1	1= 5 s, 0= 2 s (Europe fixed 1.2 s)	1	1	0	1	0	1	
5, 6	not used		0	0	0	0	0	0	
4 (16)	OP_3DCOMB	3D comb filter available	0	1	0	0	0	1	NTSC only
AP-PAL									
3 (8)	OP_COLOR_SYSTEM_AP	1: Auto, PAL 4.43, NTSC 4.43, NTSC 3.58, SECAM 0: OFF- Auto, PAL 4.43, NTSC 4.43, NTSC 3.58	0	0	1	0	0	0	
2 (4)	OP_SOUND_SYSTEM_AP_1	000: BG 001: BG / DK 010: 1 / DK 011: BG / 1 / DK	0	1	1	1	0	0	
1 (2)	OP_SOUND_SYSTEM_AP_2	100: BG / 1 / DK / M	0	0	0	0	0	0	
0 (1)	OP_SOUND_SYSTEM_AP_3		0	0	0	0	0	0	
EUROPE									
3 (8)	OP_DUMMY6	Not used	0	0	0	0	0	0	
2 (4)	OP_DUMMY7	Not used	0	0	0	0	0	0	
1 (2)	OP_WEST_EU	West Europe Set (0 - East Europe Set) by default "on"	0	0	0	0	1	0	
0 (1)	OP_MULTI_STANDARD_EUR	For Europe multi standard set	0	0	0	0	1	0	
LATAM									
3 (8)	OP_DUMMY6	Not used	0	0	0	0	0	0	
2 (4)	OP_DUMMY7		0	0	0	0	0	0	
1 (2)	OP_SYSTEM_LT_1	00: NTSC-M, 01: NTSC-M, PAL-M, 10: NTSC-M, PAL-M, PAL-N, 11: NTSC-M, PAL-M, PAL-N, PAL-BG	0	0	0	0	0	0	
0 (1)	OP_SYSTEM_LT_2		0	0	0	0	0	0	
NAFTA & AP-NTSC									
3 (8)	OP_DUMMY6	Not used	0	0	0	0	0	0	
2 (4)	OP_DUMMY7	Not used	0	0	0	0	0	0	
1 (2)	OP_DUMMY8	Not used	0	0	0	0	0	0	
0 (1)	OP_DUMMY9	Not used	0	0	0	0	0	0	
OP7:			128	148	12	132	3	144	

9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

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- 9.1 Introduction
- 9.2 Block Diagram
- 9.3 Power Supply LCD
- 9.4 Input/Output
- 9.5 Tuner and IF (diagram A1)
- 9.6 Video: TV Part (diagrams A1, A2, and A3)
- 9.7 Video: Scaler Part (diagram A7 and A13)
- 9.8 Audio Processing
- 9.9 Control
- 9.10 Abbreviation List
- 9.11 IC Data Sheets

Note:

- Only **new** (not recently published) circuits are described here. For the other circuit descriptions, see a.o. the A02, FTL13, and FTL2.1 Service Manuals.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block and circuit diagrams. Where necessary, you will find a separate drawing for clarification.

9.1 Introduction

The LC4.6 LCD TV is a global LCD TV for the year 2004. It is the successor of the LC03 LCD TV and covers screens size 30 inch with a new styling called "Entry".

This chassis has the following (new) features:

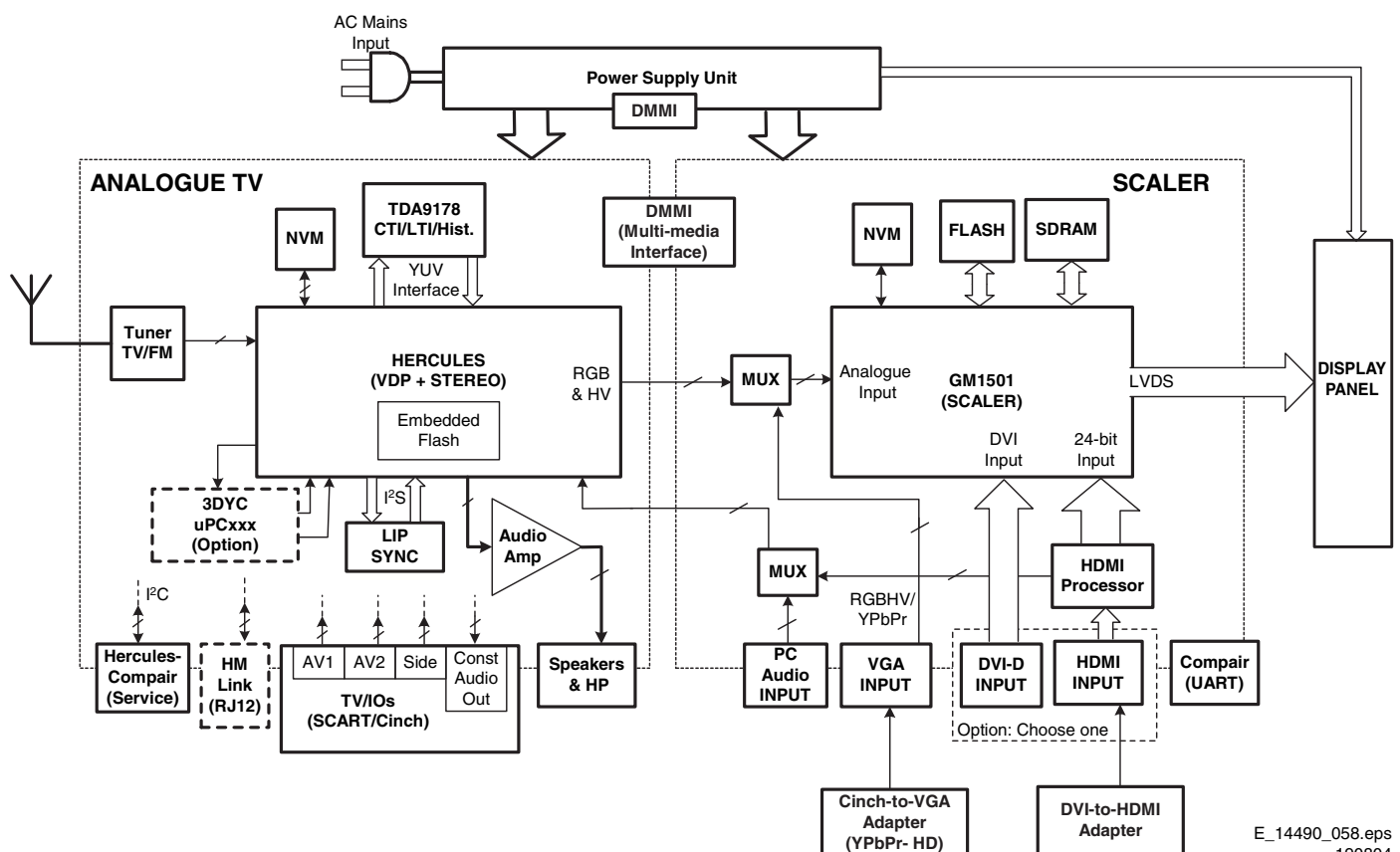
- **Audio:** The sound processor is part of the UOC processor (called "Hercules").
- **Video:** Enhanced video features, video drivers, Active Control and multiple PIP.

The architecture consists of a TV and Scaler panel, I/O panel, Side I/O and Local Keyboard panel and Power Supply panel.

The functions for video/audio processing, microprocessor (uP), and CC/Teletext (TXT) decoder are all combined in one IC (TDA120xx, item 7011), the so-called third generation Ultimate One Chip (UOC-III) or "Hercules". This chip has the following features:

- Control, small signal, mono/stereo, and extensive Audio/Video switching in one IC.
- Upgrade with digital sound & video processing.
- Alignment free IF.
- FM sound, no traps/bandpass filters.
- Full multi-standard color decoder.
- One Xtal reference for all functions (microprocessor, RCP, TXT/CC, RDS, color decoder, and stereo sound processor).

9.2 Block Diagram



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190804

Figure 9-1 Block Diagram

The PLL tuner delivers the IF-signal, via audio & video SAW-filters, to the Video Signal Processor with FLASH embedded TEXT/Control/Graphics m-Controller (TCG m-Controller) and US Closed Caption decoder. TDA120x1 (item 7011, also called Hercules). This IC has the following functions:

- Analogue Video Processing.
- Sound Demodulation.
- Audio Interfaces and switching.
- Volume and tone control for loudspeakers.
- Reflection and delay for loudspeaker channels.
- Micro Controller.
- Data Capture.
- Display.

The Hercules has one input for the internal CVBS signal and a video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed. The I/O is divided over two parts: Rear I/O and Side I/O. The rear has two AV inputs with CVBS, Y/C and YUV, a PC (VGA) input, and an HDMI input. The side has a CVBS and Y/C (SVHS) input. The video part delivers the RGB signals to the Scaler IC.

The Genesis GM1501 Malibu Scaler IC can receive different video input signals: SDTV (from Hercules), DVI/HDMI (from external DVI/HDMI source), or PC (VGA) (from external computer).

After the video processing, the digital data is send via a Low Voltage Differential Signalling bus to the LCD panel. LVDS is used to improve data speed and to reduce EMI significantly.

There are two I²C lines and two interrupt and communication lines (TV_IRQ and TV_SC_COM) for the Scaler control. The Scaler communicates with the Hercules as a slave device. To avoid buffer overflow at the Scaler side, the TV_SC_COM line provides the necessary hardware flow control. To allow bi-directional communication, the Scaler can initiate a service interrupt-request to the Hercules via the TV_IRQ line.

The Hercules, and EEPROM are supplied with 3.3 V, which is also present during STANDBY.

The EEPROMs, or NVMs (Non Volatile Memory) are used to store the settings.

The sound part is built up around the Hercules. The Source Selection, Decoding and Processing are all done by the Hercules.

Power supply input are several DC voltages coming from a supply panel.

9.3 Power Supply LCD

See the FTL2.1 manual for a detailed description.

9.4 Input/Output

The I/O is divided over two parts: Rear I/O and Side I/O. The rear has two AV inputs with CVBS, Y/C and YUV, a PC (VGA) input, and an HDMI input. The side has a CVBS and Y/C (SVHS) input.

AV1: The input of AV1 is CVBS + YUV + L/R.

AV2: The input of AV2 is Y/C + CVBS + L/R.

PC (VGA) in: This input is directly going to the Scaler IC. See paragraph "Video: Scaler Part".

HDMI in: This input is directly going to the Scaler IC. See paragraph "Video: Scaler Part".

The selection of the external I/O's is controlled by the Hercules.

9.5 Tuner and IF (diagram A1)

A Philips UV13xx Tuner is used in the TV board. The SIF signals are decoded by the Hercules. Tuning is done via I²C.

9.5.1 Video IF amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1328) and one for IF-audio (1330). The type of these filters is depending of the standard(s) that has to be received.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 31 of the Hercules to pin 1 of the tuner. The AGC-detector operates on top sync and top white level. AGC take-over point is adjusted via the service alignment mode "Tuner" - "AGC". If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal; the IF-amplifier amplifies too much.

9.6 Video: TV Part (diagrams A1, A2, and A3)

The video processing is completely handled by the Hercules:

- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also build in features like:

- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

Further, it also incorporates sound IF traps and filters, and requires only one crystal for all systems.

9.6.1 Histogram (YUV picture improvement) IC

The demodulated video-signal can be checked on pins 74, 75, and 76 of IC7011 and is fed to pins 70, 71, and 72. In this path, the Histogram IC TDA9171 is inserted.

This TDA9178 can control various picture improvements:

- Histogram processing.
- Color transient improvement.
- Luminance transient improvement.
- Black and white stretch.
- Skin tone correction.
- Green enhancement.
- Blue stretch.
- Smart peaking.
- Video dependent coring.
- Color dependent stretching.

Since the TDA9171 is connected to the Hercules, picture improvement works only for signals that are routed through the Hercules and not for signals directly connected to the Scaler.

9.7 Video: Scaler Part (diagram A7 and A13)

The Genesis GM1501 Scaler is a dual channel graphics and video processing IC for LCD monitors and televisions incorporating Picture in Picture, up to SXGA output resolutions. The Scaler controls the display processing in an LCD TV, e.g. like the deflection circuit in a CRT-based TV. It controls all the view modes (e.g. like "zooming" and "shifting"). Features like PC (VGA) or HD inputs, are also handled by this part.

9.7.1 Features

The Scaler provides several key IC functions:

- Scaling.
- Auto-configuration/ Auto-Detection.
- Various Input Ports:
 - Analog RGB.
 - Video Graphics.
- Integrated LVDS Transmitter.
- On-chip Micro-controller.

9.7.2 Inputs

Analog RGB

The RGB input is fed to pins B2, C2 and D2. This input consists of either the Hercules RGB output or the RGB/YpBPr input of the VGA connector. The Scaler can switch between the two signals via the PC_HD_SEL signal and selection IC SM5301.

PC (VGA) input

The VGA input is processed by the VGA block of the Scaler. The Scaler supports pixel frequencies up to 165 MHz. YPbPr format is also supported via the VGA interface and covers resolutions of: 480p/560p/720p/1080i.

HDMI input

HDMI input signals are fed to the HDMI Panellink Receiver (item 7808 on diagram A12). This IC consists of a flexible audio and video interface.

The video part delivers RGB/YpBPr output, that directly is fed to the Scaler.

The audio part delivers a 2-channel I2S digital audio signal that is fed to the audio DAC (item 7809). After DA conversion, the signals are fed to the Hercules.

Note: For more information about the HDMI signals see the A02 Service Manual.

9.7.3 Output

The Display Output Port provides data and control signals that permit the Scaler to connect to a variety of display devices using a TTL or LVDS interface. The output interface is configurable for single or dual wide TTL/LVDS in 18, 24 or 30-bit RGB pixels format. All display data and timing signals are synchronous with the DCLK output clock. The integrated LVDS transmitter is programmable to allow the data and control signals to be mapped into any sequence depending on the specified receiver format.

9.8 Audio Processing

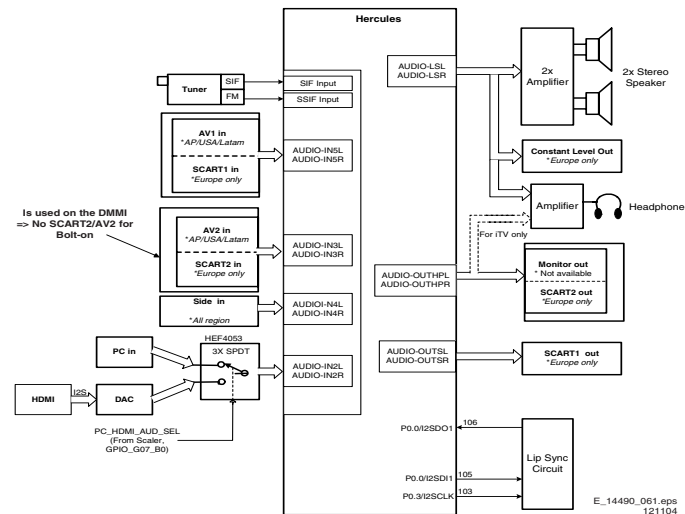


Figure 9-2 Block diagram audio processing

The audio decoding is done entirely via the Hercules. The IF output from the Tuner is fed directly to either the Video-IF or the Sound-IF input depending on the type of concept chosen. There are mainly two types of decoder in the Hercules, an analogue decoder that decodes only Mono, regardless of any standards, and a digital decoder (or DEMDEC) that can decode both Mono and Stereo, again regardless of any standards.

In this chassis, the analogue decoder is used in two cases:

- It is used for AM Sound demodulation in the Europe SECAM LL' transmission.
- It is used for all FM demodulation in AV-Stereo sets.

9.8.1 Diversity

The diversity for the Audio decoding can be broken up into two main concepts:

- The Quasi Split Sound concept used in Europe and some AP sets.
 - The Inter Carrier concept, used in NAFTA and LATAM.
- The UOC-III family makes no difference any more between QSS- and Intercarrier IF, nearly all types are software-switchable between the two SAW-filter constructions.

Simple data settings are required for the set to determine whether it is using the Inter Carrier or the QSS concept. These settings are done via the "QSS" and "FMI" bit found in SAM mode. Due to the diversity involved, the data for the 2 bits are being placed in the NVM location and it is required to write once during start-up.

On top of that, it can be further broken down into various systems depending on the region. The systems or region chosen, will in turn affect the type of sound standard that is/are allowed to be decoded.

- For Europe, the standard consists of BG/DK/I/LL' for a Multi-System set. There are also versions for Eastern Europe and Western Europe and the standard for decoding will be BG/DK and I/DK respectively. FM Radio is a feature diversity for the Europe. The same version can have either FM Radio or not, independent of the system (e.g. sets with BG/DK/I/LL' can have or not have FM radio).
- For NAFTA and LATAM, there is only one transmission standard, which is the M standard. The diversity then will be based on whether it has a dBx noise reduction or a Non-dBx (no dBx noise reduction).
- For AP, the standard consists of BG/DK/I/M for a Multi-System set. The diversity here will depend on the region.

AP China can have a Multi-System and I/DK version. For India, it might only be BG standard.

9.8.2 Functionality

The features available in the Hercules are as follows:

- Treble and Bass Control.
- Surround Sound Effect that includes:
 - Incredible Stereo.
 - Incredible Mono.
 - 3D Sound (not for AV Stereo).
 - TruSurround (not for AV Stereo).
 - Virtual Dolby Surround, VDS422 (not for AV Stereo).
 - Virtual Dolby Surround, VDS423 (not for AV Stereo).
 - Dolby Pro-Logic (not for AV Stereo).
- Bass Feature that includes:
 - Dynamic Ultra-Bass.
 - Dynamic Bass Enhancement.
 - BBE (not for AV Stereo).
- Auto-Volume Leveller.
- 5 Band Equalizer.
- Loudness Control.

All the features stated are available for the Full Stereo versions and limited features for the AV Stereo.

9.8.3 Audio Amplifier Panel (diagram SA3)

Introduction

This panel contains the audio filters and amplifiers necessary for driving the speakers.

The audio inputs come from the SSB (via connector 1739). The PSU delivers the positive and negative supply voltage of 16 V_{DC}.

After being filtered and amplified, the signals go to the speaker section, where the full range speakers are driven (load impedance is 8 ohm).

Amplifier

The amplifier is an integrated class-D amplifier (TDA7490). It combines a good performance with a high efficiency, resulting in a big reduction in heat generation.

Principle

Audio-power-amplifier systems have traditionally used linear amplifiers, which are well known for being inefficient. In fact, a linear Class AB amplifier is designed to act as a variable resistor network between the power supply and the load. The transistors operate in their linear region, and the voltage that is dropped across the transistors (in their role as variable resistors) is lost as heat, particularly in the output transistors. Class D amplifiers were developed as a way to increase the efficiency of audio-power-amplifier systems.

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.

By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.

The output transistors of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance (R_{DS(ON)}), little voltage is dropped across them, further reducing losses.

A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal. In order to keep the distortion low, negative feedback is applied (via R3723/3708).

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current. The **disadvantage** is the large output filter that drives up cost and size. The main reason for this filter is that the switching

waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency, allows the switching current to flow through the filter instead of the load. The filter is less lossy than the speaker, which causes less power dissipated at high output power and increases efficiency in most cases.

Mute

A mute switch (item 7701) is provided at pin 6. This switch is controlled by the SOUND_ENABLE line from the Hercules (mute during operation).

Protections

Because of the symmetrical supply, a DC-blocking capacitor, between the amplifier and the speaker, is not necessary. However, it is still necessary to protect the speaker for DC voltages. Therefore, the following protections are therefore implemented:

- Via R3765 and R3767, each stabilised supply voltage line is checked on deviations.
- Via R3718 and 3717, each amplifier output is checked for DC-voltage.

9.8.4 Audio: Lip Sync (Optional)

A "lip sync" circuit with an audio delay can be added (not for all models/regions), in order to synchronise with video delay due to the complexity of the display processing. This video delay is significant, due to memory based processing. For instance, the "frame rate conversion" cause a delay of two frames, while the LCD panel response also cause a delay.

The circuit is a (16 bit) FIFO based digital delay. E.g.: the memory size required for a 80 ms delay (with a data clock of 1.024 MHz) can be calculated with: Memory size = delay time * f_{clk}. This gives: 80 ms * 1.024 MHz = 81920 bits.

To calculate the memory size for a 16 bits mode I2S digital audio stream we must use the following data:

- f_s = 32 kHz, 16 bits, stereo
- Data clock = 32 kHz * 16 * 2 = 1.024 MHz
- Memory size for 1 ms delay = 1 ms * 1.024 MHz = 1024 bits = 1 kbit

So, the delay time of 80 ms can be built with five steps of 16 ms, which is close to the frame rate. Therefore, a 128 kbit SRAM (16 x 8) is chosen.

Note that above described calculation is just an example, values in the set can deviate.

9.9 Control

9.9.1 Hercules

The System Board has two main micro-controllers on board. These are:

- On-chip x86 micro-controller (OCM) from Genesis LCD TV/Monitor Controller.
- On-chip 80C51 micro-controller from Philips Semiconductors UOCIII (Hercules) series.

Each micro-controller has its own I²C bus which host its own internal devices.

The Hercules is integrated with the Video and Audio Processor. For dynamic data storage, such as SMART PICTURE and SMART SOUND settings, an external NVM IC is being used. Another feature includes an optional Teletext/Closed Caption decoder with the possibility of different page storage depending on the Hercules type number.

The Micro Controller ranges in ROM from 128 kB with no TXT-decoder to 128 kB with a 10 page Teletext or with Closed Caption.

9.9.2 Block Diagram

The block diagram of the Micro Controller application is shown below.

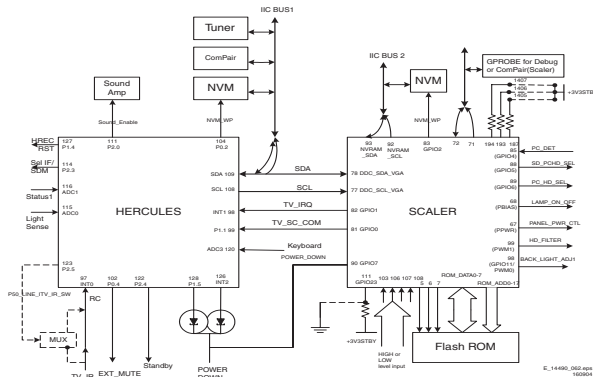


Figure 9-3 Micro Controller block diagram

9.9.3 Basic Specification

The Micro Controller operates at the following supply voltages:

- +3.3 V_{DC} at pins 4, 88, 94, and 109.
- +1.8 V_{DC} at pins 93, 96, and 117.
- I²C pull up supply: +3.3 V_{DC}.

9.9.4 Pin Configuration and Functionality

The ports of the Micro Controller can be configured as follows:

- A normal input port.
- An input ADC port.
- An output Open Drain port.
- An output Push-Pull port.
- An output PWM port.
- Input/Output Port

The following table shows the ports used for the L04 control:

Table 9-1 Micro Controller ports overview

Pin	Name	Description	Configuration
97	INT0/ P0.5	IR	INT0
98	P1.0/ INT1	TV_IRQ	INT2
99	P1.1/ T0	TV_SC_COM	P1.1
102	P0.4/ I2SWS	EXT_MUTE	P0.4
103	P0.3/ I2SCLK	Lip Sync	I2SCLK
104	P0.2/ I2SDO2	NVM_WP	P0.2
105	P0.1/ I2SDO1	Lip Sync	I2SDO1
106	P0.0/ I2SDI/O	Lip Sync	I2SDI/O
107	P1.3/ T1	PC-TV_LED	P1.3
108	P1.6/ SCL	SCL	SCL
109	P1.7/ SDA	SDA	SDA
111	P2.0/ TPWM	SOUND_ENABLE	P2.0
112	P2.1/ PWM0	(for future use)	-
113	P2.2/ PWM1	(for future use)	-
114	P2.3/ PWM2	SEL_IF	P2.3
115	P3.0/ ADC0	Light Sensor - SDM	ADC0
116	P3.1/ ADC1	STATUS_1	ADC1
119	P3.2/ ADC2	STATUS_2	ADC2
120	P3.3/ ADC3	KEYBOARD	ADC3
122	P2.4/ PWM3	STANDBY	P2.4

Pin	Name	Description	Configuration
123	P2.5/ PWM4	(for future use)	-
126	P1.2/ INT2	(for future use)	-
127	P1.4/ RX	HERC_RESET	-
128	P1.5/ TX	POWER_DOWN	P1.5

The description of each functional pin is explained below:

- LED.** This signal is used to drive the LED for Stand-by, Remote, and Error Indication:
 - During protection mode, the LED blinks and the set is in Stand-by mode.
 - During error conditions it blinks at a predefined rate.
 - After receiving a valid RC or local keyboard command it flashes once.
 - For sets with error message indication, the LED blinks when message is active and the set is in Stand-by mode.
- SCL.** This is the clock wire of the two-wire single master bi-directional I²C bus.
- SDA.** This is the data wire of the two-wire single master bi-directional I²C bus.
- STANDBY.** The Hercules generates this signal. This can enable the power supply in normal operation and disable it during Stand-by. It is of logic "high" (3.3 V) under normal operation and "low" (0 V) during Stand-by.
- IR.** This input pin is connected to an RC5 remote control receiver.
- SEL-IF.** This is an output pin to switch the Video SAW filter between M system and other systems.
 - 0: NTSC M (default).
 - 1: PAL B/G, DK, I, L.
- NVM_WP.** The global protection line is used to enable and disable write protection to the NVM. When write to the NVM is required, pin 7 of the NVM must be pulled to logic "0" first (via Write_Protect of the micro-controller pin) before a write is performed. Otherwise pin 7 of NVM must always be at logic "1"
 - 0: Disabled.
 - 1: Enabled (default).
- SOUND_ENABLE.** This pin is use to MUTE the audio amplifier. It is configured as push pull.
- STATUS_1.** This signal is used to read the status of the SCART 1 input (EU only).
- STATUS_2.** This signal is used to read the status of the SCART 2 input (EU only).
- HERC_RESET.** This pin is use to switch the +1.8 V supply.
- POWER_DOWN.** The power supply generates this signal. Logic "high" (3.3 V) under normal operation of the TV and goes "low" (0 V) when the Mains input voltage supply goes below 70 V_{AC}.
- KEYBOARD.** Following are the Keyboard functions and the step values (8 bit) for it.

Table 9-2 Local keyboard values

Function	Voltage (V _{DC})	Step values (8 bit)
P+ / Ch+	0.43	7 - 33
P- / Ch-	0.93	54 - 73
Menu (Vol - and Vol +)	1.19	74 - 96
Vol -	1.49	97 - 121
Vol +	2.12	148 - 169

- TV_IRQ.** This signal is the interrupt from the Scaler IC.
- TV_SC_COM.** This signal is used for the communication with the Scaler IC.
- EXT_MUTE.** This signal is used to reduce the switch "off" pop.

9.10 Abbreviation List

1080i	1080 visible lines, interlaced	FBL-SC2-IN	Fast blanking signal for SCART2 in
1080p	1080 visible lines, progressive scan	FBL-TXT	Fast Blanking Teletext
2CS	2 Carrier Sound	FLASH	FLASH memory
2DNR	Spatial (2D) Noise Reduction	FM	Field Memory / Frequency Modulation
3DNR	Temporal (3D) Noise Reduction	FMR	FM Radio
480i	480 visible lines, interlaced	FRC	Frame Rate Converter
480p	480 visible lines, progressive scan	FRONT-C	Front input chrominance (SVHS)
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeping up the original aspect ratio	FRONT-DETECT	Front input detection
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page	FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
ADC	Analogue to Digital Converter	FTV	Flat TeleVision
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency	G-SC1-IN	Green SCART1 in
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box	G-SC2-IN	Green SCART2 in
AM	Amplitude Modulation	G-TXT	Green teletext
AUO	Acer Unipack Optonics	H	H_sync to the module
AP	Asia Pacific	HD	High Definition: 720p, 1080i, 1080p
AR	Aspect Ratio: 4 by 3 or 16 by 9	HDMI	High Definition Multimedia Interface, digital audio and video interface
ASD	Automatic Standard Detection	HP	HeadPhone
AV	Audio Video	I	Monochrome TV system. Sound carrier distance is 6.0 MHz
B-SC1-IN	Blue SCART1 in	I2C	Integrated IC bus
B-SC2-IN	Blue SCART2 in	I2S	Integrated IC Sound bus
B-TXT	Blue teletext	IC	Integrated Circuit
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz	IF	Intermediate Frequency
BTSC	Broadcast Television System Committee	Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
C-FRONT	Chrominance front input	IR	Infra Red
CBA	Circuit Board Assembly (or PWB)	IRQ	Interrupt ReQuest
CL	Constant Level: audio output to connect with an external amplifier	Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes
CLUT	Color Look Up Table	LATAM	LATin America
ComPair	Computer aided rePair	LC04	Philips chassis name for LCD TV 2004 project
CSM	Customer Service Mode	LCD	Liquid Crystal Display
CVBS	Composite Video Blanking and Synchronisation	LED	Light Emitting Diode
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)	L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
CVBS-INT	CVBS signal from Tuner	LPL	LG Philips LCD
CVBS-MON	CVBS monitor signal	LS	LoudSpeaker
CVBS-TER-OUT	CVBS terrestrial out	LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
DAC	Digital to Analogue Converter	M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
DBE	Dynamic Bass Enhancement: extra low frequency amplification	MOSFET	Metal Oxide Semiconductor Field Effect Transistor
DFU	Directions For Use: owner's manual	MPEG	Motion Pictures Experts Group
DNR	Dynamic Noise Reduction	MSP	Multi-standard Sound Processor: ITT sound decoder
DRAM	Dynamic RAM	MUTE	MUTE Line
DSP	Digital Signal Processing	NAFTA	North American Free Trade Association: Trade agreement between Canada, USA and Mexico
DST	Dealer Service Tool: special (European) remote control designed for service technicians	NC	Not Connected
DTS	Digital Theatre Sound	NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, used mainly in Europe.
DVD	Digital Versatile Disc	NTSC	National Television Standard Committee. Color system used mainly in North America and Japan. Color carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
DVI	Digital Visual Interface	NVM	Non Volatile Memory: IC containing TV related data (for example, options)
DW	Double Window	O/C	Open Circuit
ED	Enhanced Definition: 480p, 576p	ON/OFF LED	On/Off control signal for the LED
EEPROM	Electrically Erasable and Programmable Read Only Memory		
EU	EUrope		
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)		
FBL	Fast Blanking: DC signal accompanying RGB signals		
FBL-SC1-IN	Fast blanking signal for SCART1 in		

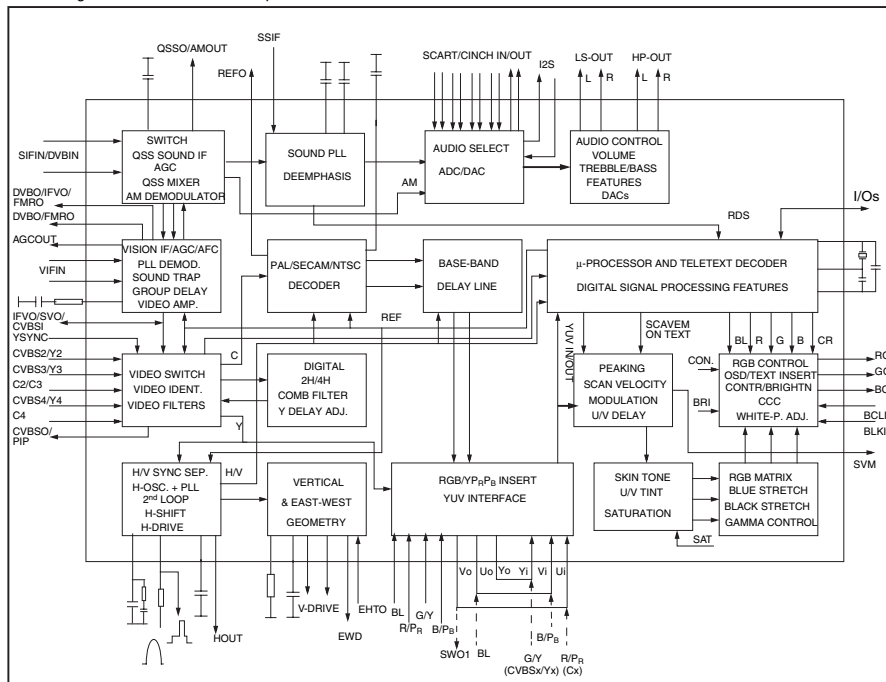
OSD	On Screen Display	VGA	Video Graphics Array
PAL	Phase Alternating Line. Color system used mainly in Western Europe (color carrier = 4.433619 MHz) and South America (color carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)	WD	Watch Dog
		WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
PC	Personal Computer	XTAL	Quartz crystal
PCB	Printed Circuit Board (or PWB)	YPbPr	Component video (Y= Luminance, Pb/Pr= Color difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV)
PDP	Plasma Display Panel	Y/C	Video related signals: Y consists of luminance signal, blanking level and sync; C consists of color signal.
PIG	Picture In Graphic		
PIP	Picture In Picture	Y-OUT	Luminance-signal
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency	YUV	Baseband component video (Y= Luminance, U/V= Color difference signals)
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.		
PWB	Printed Wiring Board (or PCB)		
RAM	Random Access Memory		
RC	Remote Control transmitter		
RC5 (6)	Remote Control system 5 (6), the signal from the remote control receiver		
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.		
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync		
ROM	Read Only Memory		
SAM	Service Alignment Mode		
SC	SandCastle: two-level pulse derived from sync signals		
SC1-OUT	SCART output of the MSP audio IC		
SC2-B-IN	SCART2 Blue in		
SC2-C-IN	SCART2 chrominance in		
SC2-OUT	SCART output of the MSP audio IC		
S/C	Short Circuit		
SCL	Clock signal on I2C bus		
SD	Standard Definition: 480i, 576i		
SDA	Data signal on I2C bus		
SDI	Samsung Display Industry		
SDM	Service Default Mode		
SDRAM	Synchronous DRAM		
SECAM	SEquence Couleur Avec Memoire. Color system used mainly in France and Eastern Europe. Color carriers = 4.406250 MHz and 4.250000 MHz		
SIF	Sound Intermediate Frequency		
SMPS	Switch Mode Power Supply		
SND	SouND		
SNDL-SC1-IN	Sound left SCART1 in		
SNDL-SC1-OUT	Sound left SCART1 out		
SNDL-SC2-IN	Sound left SCART2 in		
SNDL-SC2-OUT	Sound left SCART2 out		
SNDR-SC1-IN	Sound right SCART1 in		
SNDR-SC1-OUT	Sound right SCART1 out		
SNDR-SC2-IN	Sound right SCART2 in		
SNDR-SC2-OUT	Sound right SCART2 out		
SNDS-VL-OUT	Surround sound left variable level out		
SNDS-VR-OUT	Surround sound right variable level out		
SOPS	Self Oscillating Power Supply		
S/PDIF	Sony Philips Digital InterFace		
SRAM	Static RAM		
STBY	Stand-by		
SVHS	Super Video Home System		
SW	Sub Woofer / SoftWare		
THD	Total Harmonic Distortion		
TXT	TeleteXT		
uP	Microprocessor		
VL	Variable Level out: processed audio output toward external amplifier		
VCR	Video Cassette Recorder		

9.11 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.11.1 Diagram A2, Type TDA12029H (IC7011)

Block diagram of the “AV-stereo” TV processor with audio DSP



Pin configuration “stereo” and “AV-stereo” versions with Audio DSP

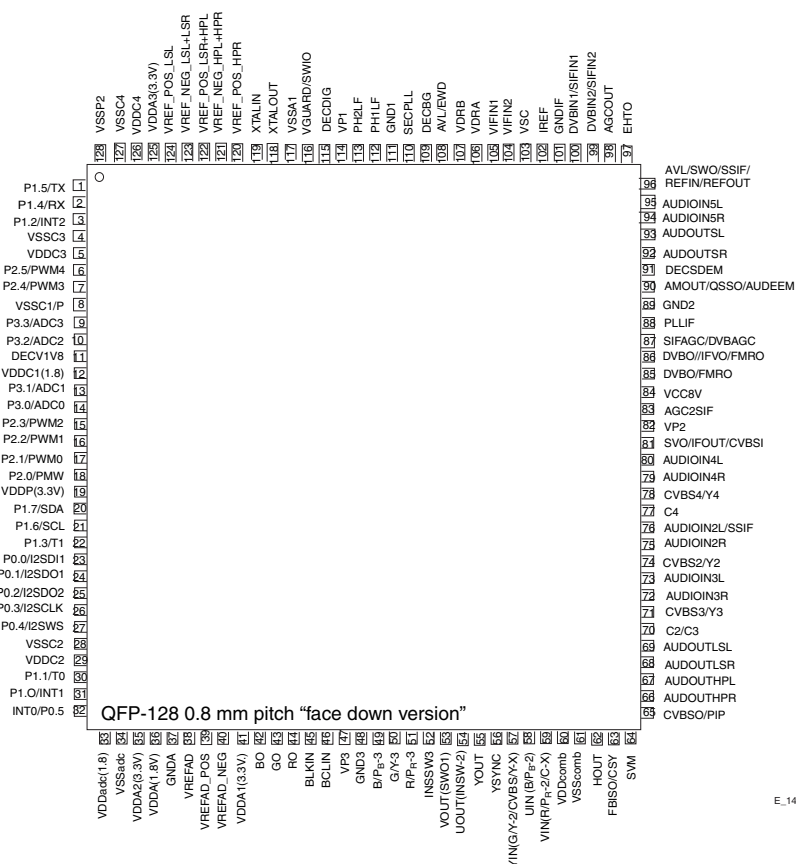
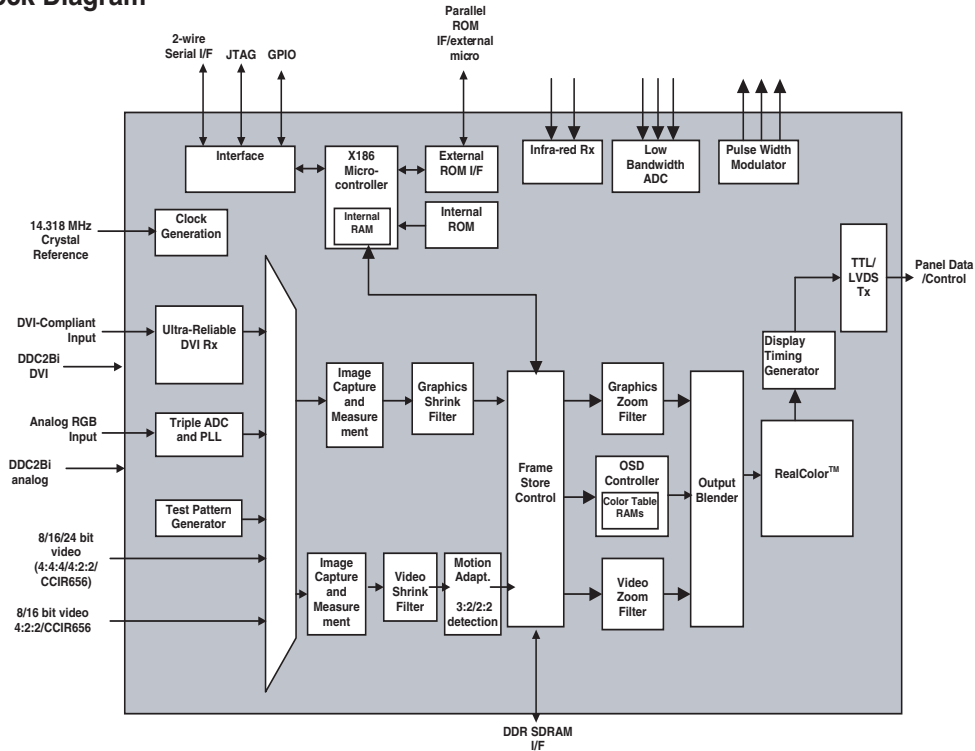


Figure 9-4 Internal Block Diagram and Pin Configuration

9.11.2 Diagram A7, Type GM1501 (IC7401)

Block Diagram



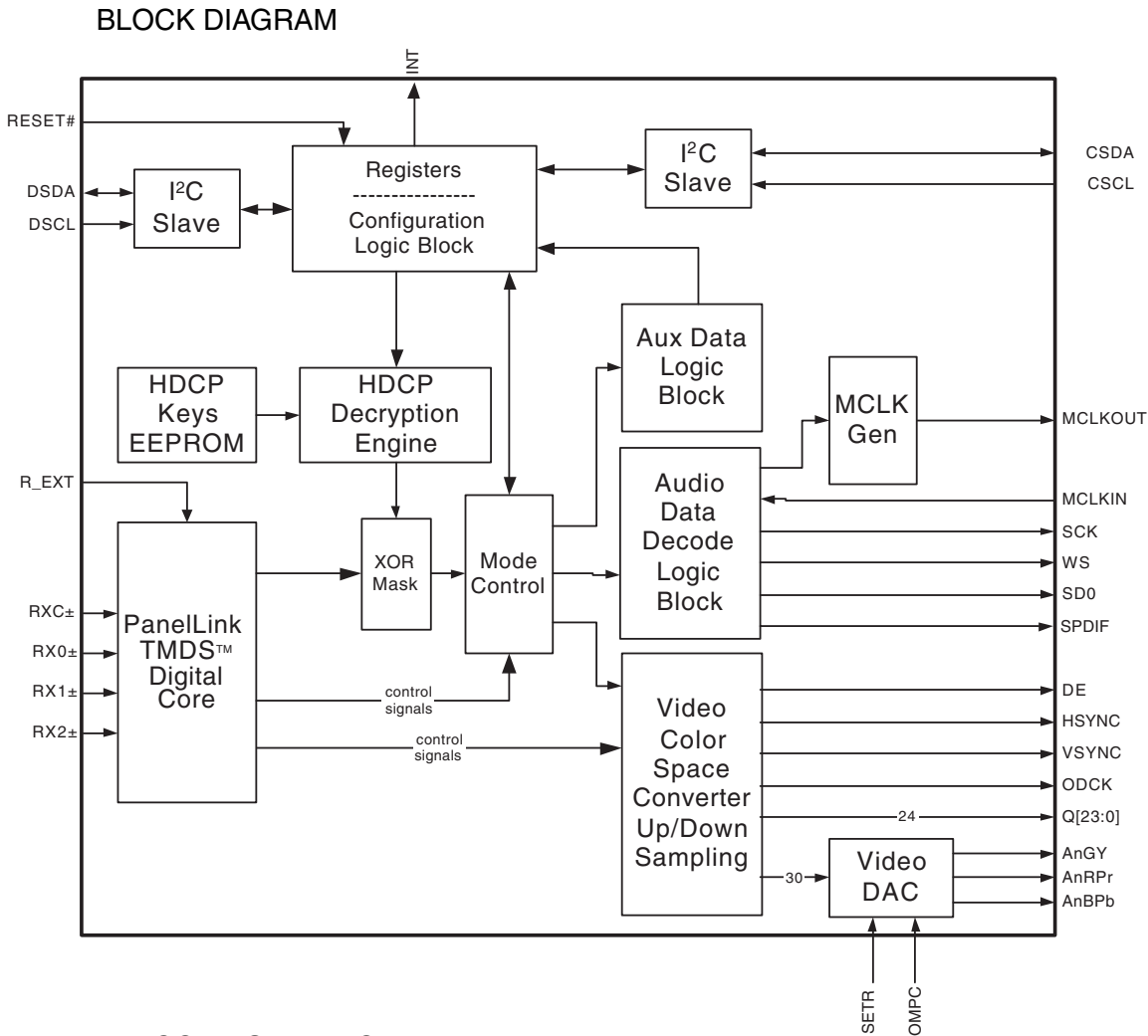
Pin Configuration

A	NC	ADC_3.3	ADC_1.8	ADC_1.8	ADC_DGND	RXC+	DVI_GND	RX0+	RX1+	RX2+	DVI_GND	LBADC_N3	D_GND
B	BLUE-	BLUE+	ADC_3.3	ADC_DGND	DVI_GND	RXC-	DVI_GND	RX0-	RX1-	RX2-	REXT	LBADC_N2	D_GND
C	GREEN-	GREEN+	SOG	ADC_GND	NC	DVI_3.3	DVI_GND	DVI_3.3	DVI_3.3	DVI_3.3	DVI_3.3	LBADC_N1	LBADC_3.3
D	RED-	RED+	ADC_3.3	ADC_AGND	NC	DVI_1.8	DVI_GND	DVI_1.8	DVI_1.8	DVI_1.8	DVI_GND	LBADC_RETURN	LBADC_GND
E	ADC_AGND	ADC_AGND	ADC_3.3	ADC_AGND									
F	NC	VDD33_PLL	VSSA33_RPLL	VDDA33_RPLL									
G	VDDA33_FPLL	VSSD33_PLL	TCLK	XTAL									
H	VDD33_SDDS	VSSA33_SDDS	VDDA33_SDDS	VSSA33_FPLL									
J	VDD33_DDSD	VSSA33_DDSD	VDDA33_DDSD	VSSD33_DDSD									
K	RESETn	ACS_RSET_HD	NC	VSSD33_DDSD						CORE_1.8	CORE_1.8	D_GND	D_GND
L	OCM_INT2	OCM_INT1	AVSYNC	AHSYNC						D_GND	CORE_1.8	D_GND	D_GND
M	OCM_UD0	OCM_UD1	IR0	IR1						D_GND	D_GND	D_GND	D_GND
N	VGA_SDA	VGA_SCL	DVI_SDA	DVI_SCL						D_GND	D_GND	D_GND	D_GND
P	OCM_CS1n	OCM_CS2n	MSTR_SDA	MSTR_SCL						D_GND	D_GND	D_GND	D_GND
R	ROM_CSn	OCM_REn	OCM_WEn	EXTCLK						D_GND	D_GND	D_GND	D_GND
T	OCMADDR17	OCMADDR18	OCMADDR19	OCM_CS0n						D_GND	CORE_1.8	D_GND	D_GND
U	OCMADDR13	OCMADDR14	OCMADDR15	OCMADDR16						CORE_1.8	CORE_1.8	D_GND	D_GND
V	OCMADDR9	OCMADDR10	OCMADDR11	OCMADDR12									
W	OCMADDR6	OCMADDR7	OCMADDR8	IO_3.3									
Y	OCMADDR3	OCMADDR4	OCMADDR5	IO_3.3									
AA	OCMADDR0	OCMADDR1	OCMADDR2	IO_3.3									
AB	OCMDATA13	OCMDATA14	OCMDATA15	IO_3.3									
AC	OCMDATA10	OCMDATA11	OCMDATA12	IO_3.3	GPIO_G09_B2 (DEGRN0)	IO_3.3	DCLK	IO_3.3	GPIO_G07_B2 (DERED4)	IO_3.3	SHIELD[1] (DEGRN3)	LVDSB_3.3	LVDSB_GND
AD	OCMDATA9	OCMDATA8	OCMDATA7	OCMDATA6	GPIO_G09_B3 (DEBLU0)	GPIO_G08_B0 (DORED0)	DEN	GPIO_G08_B3 (DOBLU1)	GPIO_G07_B0 (DERED5)	GPIO_G07_B6 (DERED8)	SHIELD[2] (DEGRN4)	LVDSB_3.3	LVDSB_3.3
AE	OCMDATA8	OCMDATA7	OCMDATA6	OCMDATA5	GPIO_G09_B0 (DERED0)	GPIO_G09_B4 (DEBLU0)	GPIO_G08_B1 (DORED1)	GPIO_G08_B3 (DOGRN1)	GPIO_G07_B0 (DERED2)	GPIO_G07_B4 (DERED6)	GPIO_G07_B7 (DERED9)	SHIELD[3] (DEGRN5)	BC+ (DEGRN8)
AF	OCMDATA7	OCMDATA6	OCMDATA5	OCMDATA4	GPIO_G09_B1 (DERED1)	GPIO_G09_B5 (DEBLU1)	GPIO_G08_B2 (DOGRN0)	GPIO_G08_B4 (DOBLU0)	GPIO_G07_B1 (DERED3)	GPIO_G07_B5 (DERED7)	SHIELD[4] (DEGRN2)	B3+ (DEGRN6)	B3- (DEGRN7)
												BC- (DEGRN9)	
	1	2	3	4	5	6	7	8	9	10	11	12	13

E_14490_099.eps
241204

Figure 9-5 Internal Block Diagram and Pin Configuration

9.11.3 Diagram A12, Type Sil9993CT (IC7808)



PIN CONFIGURATION

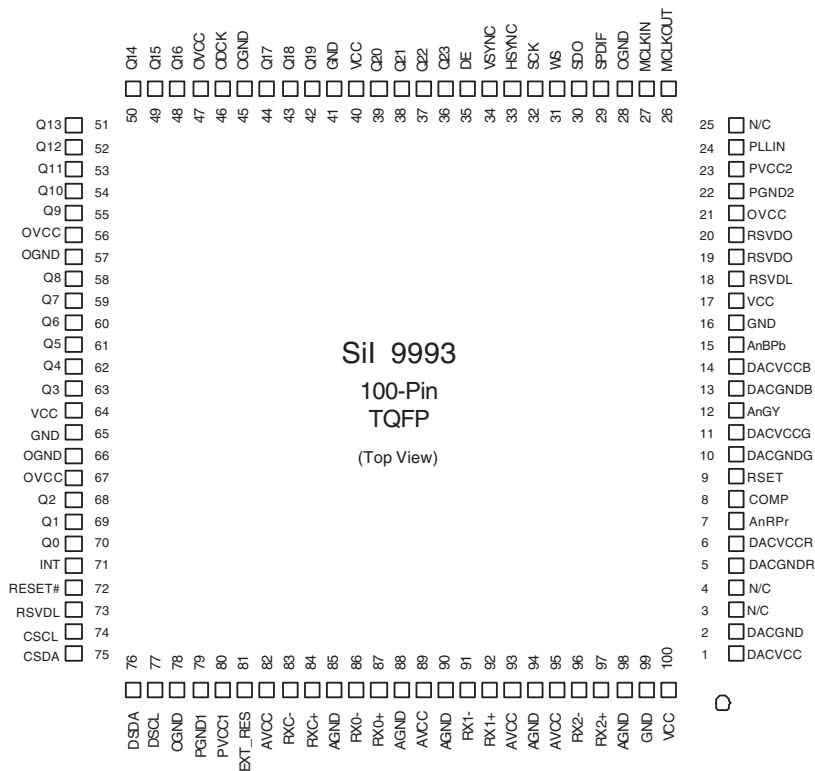


Figure 9-6 Internal Block Diagram and Pin Configuration

10. Spare Parts List

Set Level

Various

1004▲	9322 206 49682	LCD T296XW01 (AUO)
1004	9322 206 53682	LCD LC300W01 (LPL)
1005	3104 328 30812	LCD Supply US 30"
1006▲	3104 328 30002	Stand-by / Audio panel
1072	3104 328 34781	LED + Switch Panel
1102▲	3104 328 32764	Small Signal Panel AUO
1102▲	3104 328 32771	Small Signal Panel LPL
1114	3104 328 32821	Top control assy
1116	3104 328 26371	Side I/O assy LCD
8302	3104 311 04731	Cable 7p/560/7p
8303▲	3104 311 06511	Cable 10p/280/10p
8304	3104 311 08271	Cable 4p/340/4p
8305	3104 311 08411	Cable 3p/340/3p
8306▲	3104 311 01431	Cable 2P3/340/2P3
8306	3104 311 08351	Cable 2P3/340/2P3
8307	3104 311 08371	Cable 4p/340/4p
8309	3104 311 08301	Cable 3p/340/3p
8312	3104 311 06361	Cable 15p/340/15p16
8313	3104 311 08791	Cable 15P/120/15P16
8315	3104 311 06511	Cable 10p/280/10p
8317	3104 311 03611	Cable 12p/280/12p
8320	3104 311 06091	Cable 10p/680/10p
8346	3104 311 07001	Cable 11P/400/11P
8350	3104 311 08611	Cable 31P/120/20P
8352	3104 311 06811	Cable 9P/340/9P
8735	3104 311 07501	Cable 2P3/560/2P
8736	3104 311 07541	Cable 2P3/1200/2P

Small Signal Board [A]

Various

0036	3104 308 12352	Connector plate Cinch
0070	3104 308 12331	Top shielding assy
0071	3104 308 12321	Bottom shielding assy
0108	3111 254 30201	Adhesive foam
0109	3111 254 30201	Adhesive foam
0121	3104 303 10871	EMC foam tuner
0300	2422 486 80938	Socket 32p f PLCC
0328	2422 034 21798	Screwlock
0358	2511 077 00039	Connector 2p
1001	2422 543 01414	Xtal 24.576MHz
1003	3139 188 53051	3D Comb filter
1004	2422 025 15773	Connector 10p f
1175	2422 026 05384	Socket Cinch 6p f
1177	2422 026 05553	Socket phone 1p f
1182	2422 026 05553	Socket phone 1p f
1183	2422 026 05428	Connector 4p f
1251	2422 025 10655	Connector 11p m
1301	2422 025 16835	Connector 3p m
1302	3139 147 21461	Tuner UV1338/A F S H-4
1320	2422 025 10771	Connector 10p m
1328	2422 549 44377	SAW 45.75MHz M1967L
1336	2422 025 10655	Connector 11p m
1401	2422 543 01133	Xtal 14.32MHz 20pF
1402	2422 025 10768	Connector 3p m
1403	2422 025 10771	Connector 10p m
1450	2422 025 18427	Connector 31p f
1681	2422 025 16835	Connector 3p m
1686	2422 026 04754	Connector cinch 2p f
1687	2438 031 00416	Connector 15p f
1688	2422 033 00504	Socket HDMI 19p f
1690	2422 549 00146	Line filter 20V 3A
1691	2422 549 00146	Line filter 20V 3A
1692	2422 549 00146	Line filter 20V 3A
1693	2422 549 00146	Line filter 20V 3A
1752	2422 025 10769	Connector 9p m
1860	2422 549 45325	Bead 67Ω at 100MHz
1861	2422 549 45325	Bead 67Ω at 100MHz
1862	2422 549 45325	Bead 67Ω at 100MHz
1863	2422 549 45325	Bead 67Ω at 100MHz
1864	2422 549 45325	Bead 67Ω at 100MHz
8308	3104 311 07691	Cable 2p3/280/Inlet
8801	3139 131 04021	Flex foil 10p/60/10p

—||—

2000	2020 552 00035	2.2μF 6.3V 10% 0603
2001	2020 552 96718	220nF 10% 6.3V 0402
2002	4822 124 23002	10μF 16V
2003	2238 869 15109	10pF 5% 50V 0402
2004	2020 552 96718	220nF 10% 6.3V 0402

2005	3198 035 71040	100nF 10% 16V 0402	2185	3198 017 41050	1μF 10V 0603
2006	3198 034 06880	6.8pF 1% 50V 0402	2190	4822 124 23002	10μF 16V
2007	3198 034 06880	6.8pF 1% 50V 0402	2191	3198 017 41050	1μF 10V 0603
2008	2020 552 00124	470nF 10% 10V 0603	2193	4822 126 14241	330pF 0603 50V
2009	2020 552 96807	1μF 10% 10V 0603	2195	4822 126 14241	330pF 0603 50V
2010	3198 035 26820	6.8nF 10% 16V 0402	2201	4822 126 14491	2.2μF 10V 0805
2011	2020 552 96718	220nF 10% 6.3V 0402	2225	2238 586 59812	100nF 20% 50V 0603
2012	4822 124 12095	100μF 20% 16V	2227	2238 586 59812	100nF 20% 50V 0603
2013	3198 035 71040	100nF 10% 16V 0402	2228	2238 586 59812	100nF 20% 50V 0603
2014	3198 035 71040	100nF 10% 16V 0402	2231	4822 126 14241	330pF 0603 50V
2015	3198 035 71040	100nF 10% 16V 0402	2232	3198 017 41050	1μF 10V 0603
2016	3198 035 71040	100nF 10% 16V 0402	2233	4822 126 14241	330pF 0603 50V
2017	3198 035 71040	100nF 10% 16V 0402	2234	3198 017 41050	1μF 10V 0603
2018	3198 035 71040	100nF 10% 16V 0402	2238	3198 035 71040	100nF 10% 16V 0402
2019	4822 124 80151	47μF 16V	2240	4822 126 13879	220nF +80-20% 16V
2020	2238 869 15101	100pF 5% 50V 0402	2241	3198 017 41050	1μF 10V 0603
2021	2020 552 96628	10nF 10% 16V 0402	2251	2238 869 15109	10pF 5% 50V 0402
2022	3198 035 02210	220pF 5% 50V 0402	2252	2238 869 15109	10pF 5% 50V 0402
2023	3198 035 71040	100nF 10% 16V 0402	2253	4822 124 23002	10μF 16V
2024	4822 124 12095	100μF 20% 16V	2254	4822 124 23002	10μF 16V
2025	3198 035 71040	100nF 10% 16V 0402	2262	4822 124 80151	47μF 16V
2026	3198 035 71040	100nF 10% 16V 0402	2263	2020 552 96656	10μF 20% 25V 1210
2027	3198 035 71040	100nF 10% 16V 0402	2264	2020 552 96656	10μF 20% 25V 1210
2028	2020 552 96628	10nF 10% 16V 0402	2265	3198 035 02210	220pF 5% 50V 0402
2029	3198 035 71040	100nF 10% 16V 0402	2266	2020 552 96632	22nF 10% 16V 0402
2030	3198 035 71040	100nF 10% 16V 0402	2268	2020 012 93795	470μF 20% 16V
2031	3198 035 71040	100nF 10% 16V 0402	2269	2020 012 93795	470μF 20% 16V
2032	3198 035 71040	100nF 10% 16V 0402	2271	2020 552 96628	10nF 10% 16V 0402
2033	2020 552 96718	220nF 10% 6.3V 0402	2302	4822 122 33761	22pF 5% 50V
2034	2020 552 00002	3.3nF 2% 50V 0805	2303	4822 122 33761	22pF 5% 50V
2035	2020 552 96656	10μF 20% 25V 1210	2307	3198 024 44730	47nF 50V 0603
2036	2020 552 96807	1μF 10% 10V 0603	2308	3198 030 82280	2.2μF 20% 50V
2037	2020 552 96807	1μF 10% 10V 0603	2309	2020 021 91871	470μF 20% 16V
2040	4822 124 23002	10μF 16V	2311	3198 030 72290	22μF 20% 35V
2041	2020 552 96718	220nF 10% 6.3V 0402	2321	5322 126 11583	10nF 10% 50V 0603
2042	2020 552 00002	3.3nF 2% 50V 0805	2355	3198 030 82280	2.2μF 20% 50V
2043	3198 035 71040	100nF 10% 16V 0402	2356	3198 030 82280	2.2μF 20% 50V
2044	2020 552 96718	220nF 10% 6.3V 0402	2357	3198 035 71040	100nF 10% 16V 0402
2045	2238 869 15109	10pF 5% 50V 0402	2358	2020 552 96625	3.3nF 10% 50V 0402
2046	2238 869 15109	10pF 5% 50V 0402	2359	2020 552 96628	10nF 10% 16V 0402
2047	2020 552 96628	10nF 10% 16V 0402	2370	2020 552 96834	1μF 20% 6.3V 0402
2048	2238 869 15109	10pF 5% 50V 0402	2371	2020 552 96834	1μF 20% 6.3V 0402
2049	2238 869 15109	10pF 5% 50V 0402	2372	2020 552 96618	1nF 10% 50V 0402
2050	2238 869 15109	10pF 5% 50V 0402	2373	2020 552 96618	1nF 10% 50V 0402
2051	2020 552 00002	3.3nF 2% 50V 0805	2374	3198 035 71040	100nF 10% 16V 0402
2053	2020 552 96618	1nF 10% 50V 0402	2375	4822 124 12082	10μF 20% 50V
2054	2020 552 96632	22nF 10% 16V 0402	2376	3198 017 41050	1μF 10V 0603
2057	2238 869 15109	10pF 5% 50V 0402	2377	3198 017 41050	1μF 10V 0603
2058	2238 869 15109	10pF 5% 50V 0402	2378	2020 552 96718	220nF 10% 6.3V 0402
2059	2238 869 15109	10pF 5% 50V 0402	2380	4822 124 12095	100μF 20% 16V
2060	3198 035 71040	100nF 10% 16V 0402	2381	3198 035 71040	100nF 10% 16V 0402
2061	4822 124 23002	10μF 16V	2382	2020 021 91871	470μF 20% 16V
2062	2238 869 15109	10pF 5% 50V 0402	2386	3198 017 41050	1μF 10V 0603
2063	3198 017 31540	150nF 10V 0603	2387	4822 126 14324	33pF 5% 50V 0402
2067	2238 869 15109	10pF 5% 50V 0402	2388	4822 126 14324	33pF 5% 50V 0402
2068	2020 552 96718	220nF 10% 6.3V 0402	2392	3198 017 41050	1μF 10V 0603
2069	2238 869 15109	10pF 5% 50V 0402	2394	3198 035 71040	100nF 10% 16V 0402
2071	4822 124 12095	100μF 20% 16V	2395	3198 035 71040	100nF 10% 16V 0402
2072	4822 126 14076	220nF +80/-20% 25V	2396	4822 124 23002	10μF 16V
2073	2020 552 96618	1nF 10% 50V 0402	2397	2020 552 96834	1μF 20% 6.3V 0402
2074	2020 552 96718	220nF 10% 6.3V 0402	2398	2020 552 96834	1μF 20% 6.3V 0402
2076	2020 552 96718	220nF 10% 6.3V 0402	2401	4822 124 80151	47μF 16V
2077	2020 552 96834	1μF 20% 6.3V 0402	2402	4822 124 80151	47μF 16V
2078	2238 869 15101	100pF 5% 50V 0402	2403	3198 035 71040	100nF 10% 16V 0402
2079	2238 869 15109	10pF 5% 50V 0402	2404	3198 035 71040	100nF 10% 16V 0402
2080	2238 869 15109	10pF 5% 50V 0402	2405	3198 035 71040	100nF 10% 16V 0402
2081	2238 869 15109	10pF 5% 50V 0402	2406	3198 035 71040	100nF 10% 16V 0402
2082	2020 552 96618	1nF 10% 50V 0402	2407	3198 035 71040	100nF 10% 16V 0402
2083	2020 552 96834	1μF 20% 6.3V 0402	2408	3198 035 71040	100nF 10% 16V 0402
2084	2020 552 96718	220nF 10% 6.3V 0402	2409	3198 035 71040	100nF 10% 16V 0402
2085	2020 552 96618	1nF 10% 50V 0402	2410	3198 035 71040	100nF 10% 16V 0402
2086	2020 552 96618	1nF 10% 50V 0402	2411	3198 035 71040	100nF 10% 16V 0402
2087	2238 869 15109	10pF 5% 50V 0402	2412	3198 035 71040	100nF 10% 16V 0402
2088	2238 869 15109	10pF 5% 50V 0402	2413	3198 035 71040	100nF 10% 16V 0402
2089	2020 552 96618	1nF 10% 50V 0402	2414	3198 035 71040	100nF 10% 16V 0402
2090	2238 869 15109	10pF 5% 50V 0402	2415	3198 035 71040	100nF 10% 16V 0402
2091	2238 869 15109	10pF 5% 50V 0402	2416	3198 035 71040	100nF 10% 16V 0402
2092	2238 869 15109	10pF 5% 50V 0402	2417	4822 124 80151	47μF 16V
2093	2238 869 15109	10pF 5% 50V 0402	2418	4822 124 80151	47μF 16V
2094	2238 869 15109	10pF 5% 50V 0402	2419	3198 035 71040	100nF 10% 16V 0402
2095	2238 869 15109	10pF 5% 50V 0402	2420	3198 035 71040	100nF 10% 16V 0402
2096	2238 869 15109	10pF 5% 50V 0402	2421	3198 035 71040	100nF 10% 16V 0402
2097	2238 869 15109	10pF 5% 50V 0402	2422	3198 035 71040	100nF 10% 16V 0402
2098	2238 869 15109	10pF 5% 50V 0402	2423	3198 035 71040	100nF 10% 16V 0402
2099	2020 552 96618	1nF 10% 50V 0402	2424	3198 035 71040	100nF 10% 16V 0402
2179	5322 126 11583	10nF 10% 50V 0603	2425	3198 035 71040	100nF 10% 16V 0402
2182	4822 126 14241	330pF 0603 50V	2426	3198 035 71040	100nF 10% 16V 0402
2183	3198 017 41050	1μF 10V 0603	2427	3198 035 71040	100nF 10% 16V 0402
2184	4822 126 14241	330pF 0603 50V	2428	3198 035 71040	100nF 10% 16V 0402

2429	3198 035 71040	100nF 10% 16V 0402	2585	2238 869 75829	82pF 5% 50V 0402	2843	4822 124 11131	47μF 6.3V
2430	3198 035 71040	100nF 10% 16V 0402	2586	2238 869 75829	82pF 5% 50V 0402	2844	3198 035 71040	100nF 10% 16V 0402
2431	3198 035 71040	100nF 10% 16V 0402	2587	3198 035 03310	330pF 5% 50V 0402	2845	3198 035 71040	100nF 10% 16V 0402
2432	3198 035 71040	100nF 10% 16V 0402	2588	3198 035 04710	470pF 50V 0402	2846	3198 035 71040	100nF 10% 16V 0402
2433	3198 035 71040	100nF 10% 16V 0402	2605	3198 035 71040	100nF 10% 16V 0402	2847	3198 017 41050	1μF 10V 0603
2434	4822 124 80151	47μF 16V	2606	3198 035 71040	100nF 10% 16V 0402	2848	3198 017 41050	1μF 10V 0603
2435	4822 124 80151	47μF 16V	2607	3198 035 71040	100nF 10% 16V 0402	2849	2020 552 96628	10nF 10% 16V 0402
2436	3198 035 71040	100nF 10% 16V 0402	2608	3198 035 71040	100nF 10% 16V 0402	2850	3198 017 41050	1μF 10V 0603
2437	3198 035 71040	100nF 10% 16V 0402	2609	3198 035 71040	100nF 10% 16V 0402	2851	3198 017 41050	1μF 10V 0603
2438	3198 035 71040	100nF 10% 16V 0402	2610	3198 035 71040	100nF 10% 16V 0402	2860	2238 869 15109	10pF 5% 50V 0402
2439	3198 035 71040	100nF 10% 16V 0402	2611	4822 124 11131	47μF 6.3V	2861	2238 869 15109	10pF 5% 50V 0402
2440	3198 035 71040	100nF 10% 16V 0402	2612	2020 552 96628	10nF 10% 16V 0402	2862	2238 869 15109	10pF 5% 50V 0402
2441	3198 035 71040	100nF 10% 16V 0402	2613	2020 552 96628	10nF 10% 16V 0402	2863	2238 869 15109	10pF 5% 50V 0402
2442	3198 035 71040	100nF 10% 16V 0402	2614	2020 552 96628	10nF 10% 16V 0402	2864	2238 869 15109	10pF 5% 50V 0402
2443	3198 035 71040	100nF 10% 16V 0402	2615	2020 552 96628	10nF 10% 16V 0402	2865	2238 869 15109	10pF 5% 50V 0402
2444	3198 035 71040	100nF 10% 16V 0402	2616	2020 552 96628	10nF 10% 16V 0402	2866	2238 869 15109	10pF 5% 50V 0402
2445	3198 035 71040	100nF 10% 16V 0402	2617	2020 552 96628	10nF 10% 16V 0402	2867	2238 869 15109	10pF 5% 50V 0402
2446	3198 035 71040	100nF 10% 16V 0402	2618	2020 552 96628	10nF 10% 16V 0402	2868	2238 869 15109	10pF 5% 50V 0402
2447	3198 035 71040	100nF 10% 16V 0402	2619	4822 126 14324	33pF 5% 50V 0402	2869	2238 869 15109	10pF 5% 50V 0402
2448	3198 035 71040	100nF 10% 16V 0402	2620	2020 552 96807	1μF 10% 10V 0603	2874	2238 869 15109	10pF 5% 50V 0402
2449	3198 035 71040	100nF 10% 16V 0402	2621	2020 552 96834	1μF 20% 6.3V 0402	2875	2238 869 15109	10pF 5% 50V 0402
2450	3198 035 71040	100nF 10% 16V 0402	2622	2020 552 96834	1μF 20% 6.3V 0402	2876	2020 552 96628	10nF 10% 16V 0402
2451	4822 124 80151	47μF 16V	2623	2020 552 96834	1μF 20% 6.3V 0402	2877	2238 869 15109	10pF 5% 50V 0402
2452	3198 035 71040	100nF 10% 16V 0402	2624	3198 017 44740	470nF 10V 0603	2878	2020 552 96628	10nF 10% 16V 0402
2453	3198 035 71040	100nF 10% 16V 0402	2625	3198 017 44740	470nF 10V 0603	2879	2020 552 96628	10nF 10% 16V 0402
2454	3198 035 71040	100nF 10% 16V 0402	2626	3198 017 44740	470nF 10V 0603	2880	2238 869 15109	10pF 5% 50V 0402
2455	3198 035 71040	100nF 10% 16V 0402	2630	2020 552 96834	1μF 20% 6.3V 0402	2881	2020 552 96628	10nF 10% 16V 0402
2456	3198 035 71040	100nF 10% 16V 0402	2631	2020 552 96834	1μF 20% 6.3V 0402	2883	2238 869 15109	10pF 5% 50V 0402
2461	3198 035 71040	100nF 10% 16V 0402	2632	2020 552 96834	1μF 20% 6.3V 0402	2884	2020 552 96628	10nF 10% 16V 0402
2462	3198 035 71040	100nF 10% 16V 0402	2633	2020 552 96834	1μF 20% 6.3V 0402	2887	2238 869 15109	10pF 5% 50V 0402
2463	3198 035 71040	100nF 10% 16V 0402	2634	2020 552 96834	1μF 20% 6.3V 0402	2910	3198 035 04710	470pF 50V 0402
2464	3198 035 71040	100nF 10% 16V 0402	2635	2020 552 96834	1μF 20% 6.3V 0402	2911	3198 030 72290	22μF 20% 35V
2465	5322 124 41945	22μF 20% 35V	2636	3198 035 71040	100nF 10% 16V 0402	2920	4822 124 80151	47μF 16V
2466	3198 035 71040	100nF 10% 16V 0402	2682	2020 552 94427	100pF 5% 50V	2921	4822 124 80151	47μF 16V
2467	3198 035 71040	100nF 10% 16V 0402	2683	2020 552 94427	100pF 5% 50V	2930	2020 021 91871	470μF 20% 16V
2468	3198 035 71040	100nF 10% 16V 0402	2688	2020 552 94427	100pF 5% 50V	2931	3198 035 04710	470pF 50V 0402
2469	3198 035 71040	100nF 10% 16V 0402	2693	2238 586 59812	100nF 20% 50V 0603	2933	2020 021 91871	470μF 20% 16V
2470	5322 124 41945	22μF 20% 35V	2698	2020 552 94427	100pF 5% 50V	2934	2020 552 96793	4.7nF 10% 50V 0402
2471	3198 035 71040	100nF 10% 16V 0402	2699	2020 552 94427	100pF 5% 50V	2935	2020 021 91871	470μF 20% 16V
2472	3198 035 71040	100nF 10% 16V 0402	2702	2020 552 96834	1μF 20% 6.3V 0402	2953	2020 021 91871	470μF 20% 16V
2473	3198 035 71040	100nF 10% 16V 0402	2707	2020 021 91871	470μF 20% 16V	2955	3198 035 14720	4.7nF 5% 25V 0402
2474	3198 035 71040	100nF 10% 16V 0402	2708	2020 552 96834	1μF 20% 6.3V 0402	2956	3198 035 02210	220pF 5% 50V 0402
2475	3198 035 71040	100nF 10% 16V 0402	2710	3198 035 04710	470pF 50V 0402	2957	2020 021 91871	470μF 20% 16V
2476	3198 035 71040	100nF 10% 16V 0402	2711	3198 035 04710	470pF 50V 0402	2958	2020 021 91871	470μF 20% 16V
2477	3198 035 71040	100nF 10% 16V 0402	2713	2238 586 59812	100nF 20% 50V 0603	2960	4822 124 80151	47μF 16V
2478	5322 124 41945	22μF 20% 35V	2714	2020 012 93795	470μF 20% 16V	2961	3198 035 71030	10nF 16V 0402
2479	3198 035 71040	100nF 10% 16V 0402	2715	2020 021 91871	470μF 20% 16V	2992	3198 035 71040	100nF 10% 16V 0402
2480	3198 035 71040	100nF 10% 16V 0402	2719	2238 586 59812	100nF 20% 50V 0603	2993	2020 552 96618	1nF 10% 50V 0402
2481	3198 035 71040	100nF 10% 16V 0402	2720	2238 869 15109	10pF 5% 50V 0402	2994	2020 021 91871	470μF 20% 16V
2482	5322 124 41945	22μF 20% 35V	2743	2020 552 96834	1μF 20% 6.3V 0402	2995	3198 035 71040	100nF 10% 16V 0402
2483	3198 035 71040	100nF 10% 16V 0402	2744	2020 552 96834	1μF 20% 6.3V 0402	2996	4822 124 80151	47μF 16V
2484	3198 035 71040	100nF 10% 16V 0402	2747	2238 869 15101	100pF 5% 50V 0402			
2485	3198 035 71040	100nF 10% 16V 0402	2748	2238 869 15101	100pF 5% 50V 0402			
2486	3198 035 71040	100nF 10% 16V 0402	2749	2238 869 15101	100pF 5% 50V 0402			
2487	4822 126 14519	22pF 5% 50V 0402	2750	2238 869 15101	100pF 5% 50V 0402			
2488	4822 126 14519	22pF 5% 50V 0402	2784	4822 126 14241	330pF 0603 50V			
2490	2238 586 59812	100nF 20% 50V 0603	2785	4822 126 14241	330pF 0603 50V	3000	3198 031 05620	5.6kΩ 5% 0.01W 0402
2491	2238 586 59812	100nF 20% 50V 0603	2803	4822 124 23237	22μF 6.3V	3001	2322 702 70398	3.9Ω 5% 0603
2492	2238 586 59812	100nF 20% 50V 0603	2806	4822 124 23237	22μF 6.3V	3002	4822 117 13601	22kΩ 5% 0402
2493	2020 552 96807	1μF 10% 10V 0603	2807	3198 035 71040	100nF 10% 16V 0402	3003	2322 702 70398	3.9Ω 5% 0603
2495	4822 124 80151	47μF 16V	2808	3198 035 71040	100nF 10% 16V 0402	3004	4822 117 13601	22kΩ 5% 0402
2496	3198 035 71040	100nF 10% 16V 0402	2809	4822 124 23002	10μF 16V	3005	3198 031 05620	5.6kΩ 5% 0.01W 0402
2501	4822 124 80151	47μF 16V	2810	4822 124 23237	22μF 6.3V	3006	4822 117 13545	100Ω 1% 0402
2502	4822 124 11131	47μF 6.3V	2811	2020 552 96618	1nF 10% 50V 0402	3007	3198 031 04720	4.7kΩ 5% 0402
2503	3198 035 71040	100nF 10% 16V 0402	2812	3198 035 71040	100nF 10% 16V 0402	3008	3198 031 04730	47Ω 5% 0402
2504	3198 035 71040	100nF 10% 16V 0402	2813	4822 124 23002	10μF 16V	3010	4822 117 13548	1kΩ 5% 0402
2505	3198 035 71040	100nF 10% 16V 0402	2814	3198 035 71040	100nF 10% 16V 0402	3011	4822 117 13543	470Ω 5% 0402
2506	3198 035 71040	100nF 10% 16V 0402	2815	2020 552 96618	1nF 10% 50V 0402	3013	4822 117 13545	100Ω 1% 0402
2507	3198 035 71040	100nF 10% 16V 0402	2816	3198 035 71040	100nF 10% 16V 0402	3015	4822 117 13605	Jumper 0402
2508	3198 035 71040	100nF 10% 16V 0402	2817	2020 552 96618	1nF 10% 50V 0402	3017	4822 117 13605	Jumper 0402
2509	3198 035 71040	100nF 10% 16V 0402	2818	4822 124 23002	10μF 16V	3019	4822 117 13545	100Ω 1% 0402
2510	3198 035 71040	100nF 10% 16V 0402	2819	3198 035 71040	100nF 10% 16V 0402	3020	4822 117 13548	1kΩ 5% 0402
2511	3198 035 71040	100nF 10% 16V 0402	2820	2020 552 96618	1nF 10% 50V 0402	3021	2322 706 72702	2.7kΩ 1% 0402
2512	3198 035 71040	100nF 10% 16V 0402	2821	2020 552 96618	1nF 10% 50V 0402	3022	4822 117 13606	10kΩ 5% 0.01W 0402
2513	3198 035 71040	100nF 10% 16V 0402	2822	2020 552 96618	1nF 10% 50V 0402	3023	4822 117 13601	22kΩ 5% 0402
2514	3198 035 71040	100nF 10% 16V 0402	2823	2020 552 96618	1nF 10% 50V 0402	3024	3198 031 01090	10Ω 5% 0.01W 0402
2515	3198 035 71040	100nF 10% 16V 0402	2824	3198 035 71040	100nF 10% 16V 0402	3025	3198 031 01090	10Ω 5% 0.01W 0402
2516	3198 035 71040	100nF 10% 16V 0402	2825	2020 552 96618	1nF 10% 50V 0402	3026	3198 031 06890	68Ω 5% 0402
2517	3198 035 71040	100nF 10% 16V 0402	2826	2020 552 96618	1nF 10% 50V 0402	3027	3198 031 01090	10Ω 5% 0.01W 0402
2526	5322 124 41945	22μF 20% 35V	2827	2020 552 96618	1nF 10% 50V 0402	3028	4822 117 11297	100kΩ 5% 0.1W
2530	4822 124 23002	10μF 16V	2828	2020 552 96618	1nF 10% 50V 0402	3029	4822 117 13548	1kΩ 5% 0402
2531	3198 035 71040	100nF 10% 16V 0402	2829	2020 552 96618	1nF 10% 50V 0402	3030	4822 117 11297	100kΩ 5% 0.1W
2532	3198 035 71040	100nF 10% 16V 0402	2830	2020 552				

3063	3198 031 06890	68Ω 5% 0402	3268	2322 704 63302	3.3kΩ 1% 0603	3547	3198 031 11030	4 x 10kΩ 5% 1206
3064	4822 117 13545	100Ω 1% 0402	3270	4822 117 13602	2.2kΩ 5% 0.01W 0402	3548	4822 117 13606	10kΩ 5% 0.01W 0402
3065	3198 031 06810	680Ω 5% 0.01W 0402	3271	3198 031 08210	820Ω 5% 0.5W	3550	4822 051 30102	1kΩ 5% 0.062W
3066	3198 031 06890	68Ω 5% 0402	3273	3198 031 02240	220kΩ 5% 0.1W 0402	3553	4822 051 30102	1kΩ 5% 0.062W
3067	3198 031 01090	10Ω 5% 0.01W 0402	3274	4822 117 13601	22kΩ 5% 0402	3560	4822 117 11297	100kΩ 5% 0.1W
3068	3198 031 06890	68Ω 5% 0402	3302	4822 051 30101	100Ω 5% 0.062W	3561	4822 117 11297	100kΩ 5% 0.1W
3069	4822 117 13601	22kΩ 5% 0402	3303	4822 051 30101	100Ω 5% 0.062W	3562	4822 117 11297	100kΩ 5% 0.1W
3070	4822 117 13545	100Ω 1% 0402	3304	4822 117 13606	10kΩ 5% 0.01W 0402	3563	4822 117 13548	1kΩ 5% 0402
3071	4822 117 13545	100Ω 1% 0402	3305	4822 117 13606	10kΩ 5% 0.01W 0402	3564	3198 031 01220	1.2kΩ 5% 0.01W 0402
3072	3198 031 06890	68Ω 5% 0402	3309	4822 117 13606	10kΩ 5% 0.01W 0402	3565	4822 117 13548	1kΩ 5% 0402
3073	3198 031 01530	15kΩ 5% 0.01W 0402	3311	4822 051 30008	Jumper 0603	3566	4822 117 13548	1kΩ 5% 0402
3074	4822 117 11297	100kΩ 5% 0.1W	3327	4822 117 13548	1kΩ 5% 0402	3567	4822 117 13548	1kΩ 5% 0402
3075	3198 031 04720	4.7kΩ 5% 0402	3328	4822 117 13545	100Ω 1% 0402	3568	4822 117 13606	10kΩ 5% 0.01W 0402
3077	3198 031 04720	4.7kΩ 5% 0402	3329	4822 117 13545	100Ω 1% 0402	3579	4822 117 13548	1kΩ 5% 0402
3078	3198 031 04720	4.7kΩ 5% 0402	3340	4822 117 13601	22kΩ 5% 0402	3580	4822 117 13543	470Ω 5% 0402
3079	3198 031 04720	4.7kΩ 5% 0402	3342	3198 031 01530	15kΩ 5% 0.01W 0402	3581	3198 031 04730	470Ω 5% 0402
3080	5322 117 13034	1.5kΩ 1% 0.063W 0603	3343	3198 031 04720	4.7kΩ 5% 0402	3605	4822 117 13545	100Ω 1% 0402
3081	4822 117 13545	100Ω 1% 0402	3344	4822 117 13548	1kΩ 5% 0402	3606	4822 117 13545	100Ω 1% 0402
3082	3198 031 04720	4.7kΩ 5% 0402	3345	3198 031 04720	4.7kΩ 5% 0402	3607	4822 117 13545	100Ω 1% 0402
3083	3198 031 04720	4.7kΩ 5% 0402	3346	2322 706 75603	56kΩ 1% 0402	3608	4822 117 13545	100Ω 1% 0402
3084	4822 117 13545	100Ω 1% 0402	3347	3198 031 08210	820Ω 5% 0.5W	3609	4822 117 13545	100Ω 1% 0402
3085	3198 031 04720	4.7kΩ 5% 0402	3348	3198 031 04720	4.7kΩ 5% 0402	3610	4822 117 13601	22kΩ 5% 0402
3086	4822 117 13602	2.2kΩ 5% 0.01W 0402	3349	3198 031 01820	1.8kΩ 5% 0.01W 0402	3612	4822 117 13543	470Ω 5% 0402
3087	4822 117 13606	10kΩ 5% 0.01W 0402	3357	4822 117 13548	1kΩ 5% 0402	3613	3198 031 02290	22Ω 5% 0.1W 0402
3088	3198 031 03320	3.3kΩ 5% 0402	3358	4822 117 13545	100Ω 1% 0402	3614	3198 031 02290	22Ω 5% 0.1W 0402
3089	3198 031 01540	150kΩ 5% 0402	3359	3198 031 03910	390Ω 1% 0402	3615	3198 031 02290	22Ω 5% 0.1W 0402
3091	4822 117 13545	100Ω 1% 0402	3370	3198 031 06810	680Ω 5% 0.01W 0402	3616	3198 031 02290	22Ω 5% 0.1W 0402
3092	3198 031 04720	4.7kΩ 5% 0402	3371	4822 117 13545	100Ω 1% 0402	3617	3198 031 02290	22Ω 5% 0.1W 0402
3093	3198 031 04720	4.7kΩ 5% 0402	3372	4822 117 13545	100Ω 1% 0402	3618	3198 031 02290	22Ω 5% 0.1W 0402
3094	3198 031 01090	10Ω 5% 0.01W 0402	3374	5322 117 11726	10Ω 5%	3619	3198 031 08210	820Ω 5% 0.5W
3096	3198 031 03320	3.3kΩ 5% 0402	3378	4822 117 13545	100Ω 1% 0402	3620	4822 117 13632	100kΩ 1% 0603 0.62W
3097	3198 031 04720	4.7kΩ 5% 0402	3380	3198 031 05620	5.6kΩ 5% 0.01W 0402	3621	4822 117 13601	22kΩ 5% 0402
3175	4822 051 30759	75Ω 5% 0.062W	3381	3198 031 05620	5.6kΩ 5% 0.01W 0402	3622	4822 117 13601	22kΩ 5% 0402
3176	4822 051 30331	330Ω 5% 0.062W	3382	3198 031 05620	5.6kΩ 5% 0.01W 0402	3623	4822 117 13601	22kΩ 5% 0402
3177	4822 051 30331	330Ω 5% 0.062W	3383	3198 031 05620	5.6kΩ 5% 0.01W 0402	3624	4822 117 13601	22kΩ 5% 0402
3178	4822 051 30759	75Ω 5% 0.062W	3386	4822 117 13545	100Ω 1% 0402	3625	4822 117 13601	22kΩ 5% 0402
3179	4822 051 30759	75Ω 5% 0.062W	3389	4822 117 13545	100Ω 1% 0402	3626	4822 117 13601	22kΩ 5% 0402
3180	4822 051 30331	330Ω 5% 0.062W	3390	4822 117 13545	100Ω 1% 0402	3633	4822 117 13545	100Ω 1% 0402
3181	4822 051 30331	330Ω 5% 0.062W	3391	4822 117 13545	100Ω 1% 0402	3634	4822 117 13545	100Ω 1% 0402
3182	4822 051 30151	150Ω 5% 0.062W	3392	4822 117 13545	100Ω 1% 0402	3635	4822 117 13545	100Ω 1% 0402
3183	4822 117 12925	47kΩ 1% 0.063W 0603	3393	4822 117 13545	100Ω 1% 0402	3638	4822 117 13545	100Ω 1% 0402
3184	4822 051 30151	150Ω 5% 0.062W	3394	3198 031 07590	75Ω 5% 0402	3639	4822 117 13545	100Ω 1% 0402
3185	4822 117 12925	47kΩ 1% 0.063W 0603	3401	2350 035 10229	4 x 22Ω 5% 1206	3641	4822 117 13597	330Ω 5% 0402 0.01W
3186	4822 051 30472	4.7Ω 5% 0.062W	3402	2350 035 10229	4 x 22Ω 5% 1206	3642	4822 117 13597	330Ω 5% 0402 0.01W
3187	4822 051 30103	10kΩ 5% 0.062W	3403	2350 035 10229	4 x 22Ω 5% 1206	3643	4822 117 13597	330Ω 5% 0402 0.01W
3188	4822 051 30103	10kΩ 5% 0.062W	3404	2350 035 10229	4 x 22Ω 5% 1206	3644	4822 117 13597	330Ω 5% 0402 0.01W
3190	4822 051 30479	47Ω 5% 0.062W	3405	2350 035 10229	4 x 22Ω 5% 1206	3645	4822 117 13597	330Ω 5% 0402 0.01W
3191	4822 051 30759	75Ω 5% 0.062W	3406	2350 035 10229	4 x 22Ω 5% 1206	3646	4822 117 13597	330Ω 5% 0402 0.01W
3192	4822 051 30759	75Ω 5% 0.062W	3407	2350 035 10229	4 x 22Ω 5% 1206	3682	4822 051 30222	2.2kΩ 5% 0.062W
3193	4822 117 13632	100kΩ 1% 0603 0.62W	3408	2350 035 10229	4 x 22Ω 5% 1206	3688	4822 051 30222	2.2kΩ 5% 0.062W
3194	4822 051 30689	68Ω 5% 0.063W 0603	3409	2350 035 10229	4 x 22Ω 5% 1206	3690	4822 051 30221	220Ω 5% 0.062W
3195	4822 117 13632	100kΩ 1% 0603 0.62W	3410	2350 035 10229	4 x 22Ω 5% 1206	3691	4822 051 30759	75Ω 5% 0.062W
3196	4822 051 30102	1kΩ 5% 0.062W	3411	2350 035 10229	4 x 22Ω 5% 1206	3692	4822 051 30759	75Ω 5% 0.062W
3197	4822 117 12891	220kΩ 1%	3412	2350 035 10229	4 x 22Ω 5% 1206	3693	4822 051 30103	10kΩ 5% 0.062W
3198	4822 117 12891	220kΩ 1%	3413	2350 035 10229	4 x 22Ω 5% 1206	3694	4822 051 30221	220Ω 5% 0.062W
3199	4822 051 30151	150Ω 5% 0.062W	3414	3198 031 02290	22Ω 5% 0.1W 0402	3695	4822 051 30759	75Ω 5% 0.062W
3200	4822 051 30151	150Ω 5% 0.062W	3415	3198 031 01090	10Ω 5% 0.01W 0402	3696	4822 051 30103	10kΩ 5% 0.062W
3201	4822 117 13632	100kΩ 1% 0603 0.62W	3416	4822 117 13548	1kΩ 5% 0402	3697	4822 051 30103	10kΩ 5% 0.062W
3202	4822 117 13632	100kΩ 1% 0603 0.62W	3417	4822 117 13548	1kΩ 5% 0402	3698	4822 051 30223	22kΩ 5% 0.062W
3203	4822 051 30102	1kΩ 5% 0.062W	3418	3198 031 03910	390Ω 1% 0402	3699	4822 051 30223	22kΩ 5% 0.062W
3204	4822 051 30101	100Ω 5% 0.062W	3422	3198 031 02290	22Ω 5% 0.1W 0402	3700	4822 117 12925	47kΩ 1% 0.063W 0603
3220	4822 051 30331	330Ω 5% 0.062W	3423	3198 031 03320	3.3kΩ 5% 0402	3701	4822 117 13548	1kΩ 5% 0402
3221	4822 051 30221	220Ω 5% 0.062W	3424	2322 704 61501	150Ω 1% 0603	3702	4822 117 13602	2.2kΩ 5% 0.01W 0402
3222	4822 051 30759	75Ω 5% 0.062W	3425	4822 117 13606	10kΩ 5% 0.01W 0402	3703	4822 117 13606	10kΩ 5% 0.01W 0402
3223	4822 051 30759	75Ω 5% 0.062W	3426	3198 031 03320	3.3kΩ 5% 0402	3704	4822 117 13543	470Ω 5% 0402
3225	4822 117 13632	100kΩ 1% 0603 0.62W	3428	4822 117 13606	10kΩ 5% 0.01W 0402	3705	4822 117 13606	10kΩ 5% 0.01W 0402
3226	4822 117 13632	100kΩ 1% 0603 0.62W	3429	4822 117 13606	10kΩ 5% 0.01W 0402	3711	3198 031 03390	33Ω 1% 0402
3227	4822 051 30472	4.7Ω 5% 0.062W	3432	4822 117 13606	10kΩ 5% 0.01W 0402	3712	4822 117 13606	10kΩ 5% 0.01W 0402
3228	4822 051 30472	4.7Ω 5% 0.062W	3433	4822 117 13606	10kΩ 5% 0.01W 0402	3713	4822 117 13606	10kΩ 5% 0.01W 0402
3229	4822 117 13632	100kΩ 1% 0603 0.62W	3436	4822 117 13606	10kΩ 5% 0.01W 0402	3716	4822 117 13543	470Ω 5% 0402
3230	4822 117 13632	100kΩ 1% 0603 0.62W	3437	4822 117 13606	10kΩ 5% 0.01W 0402	3718	3198 031 03390	33Ω 1% 0402
3231	4822 051 30151	150Ω 5% 0.062W	3438	3198 031 11030	4 x 10kΩ 5% 1206	3721	4822 117 13543	470Ω 5% 0402
3232	4822 117 12925	47kΩ 1% 0.063W 0603	3439	3198 031 11030	4 x 10kΩ 5% 1206	3723	4822 117 13548	1kΩ 5% 0402
3233	4822 051 30151	150Ω 5% 0.062W	3440	3198 031 11030	4 x 10kΩ 5% 1206	3724	4822 117 13606	10kΩ 5% 0.01W 0402
3234	4822 117 12925	47kΩ 1% 0.063W 0603	3441	3198 031 11030	4 x 10kΩ 5% 1206	3728	4822 117 13602	2.2kΩ 5% 0.01W 0402
3235	4822 051 30223	22kΩ 5% 0.062W	3442	3198 031 11030	4 x 10kΩ 5% 1206	3729	3198 031 03920	3.9kΩ 5% 0402
3236	4822 051 30223	22kΩ 5% 0.062W	3443	4822 117 13606	10kΩ 5% 0.01W 0402	3739	4822 117 13601	22kΩ 5% 0402
3237	4822 051 30223	22kΩ 5% 0.062W	3444	4822 051 30103	10kΩ 5% 0.062W	3740	4822 117 13601	22kΩ 5% 0402
3238	4822 117 13597	330Ω 5% 0.0402 0.01W	3446	5322 117 13017	100Ω 1% 0.063W 0603	3741	4822 117 11297	100kΩ 5% 0.1W
3239	4822 051 30223	22kΩ 5% 0.062W	3447	3198 031 02290	22Ω 5% 0.1W 0402	3742	4822 117 13601	22kΩ 5% 0402
3240	4822 117 12864	82kΩ 5% 0.6W	3448	3198 031 01090	10Ω 5% 0.01W 0402	3743	4822 117 13601	22kΩ 5% 0402
3241	4822 117 12925	47kΩ 1% 0.063W 0603	3501	4822 117 12706	10kΩ 1% 0.063W 0603	3745	4822 117 11297	100kΩ 5% 0.1W
3242	4822 051 30102	1kΩ 5% 0.062W	3502	4822 117 12706	10kΩ 1% 0.063W 0603	3752	3198 031 01510	150Ω 5% 0.01W 0402
3243	4822 051 30103							

3803	3198 031 13390	4X 33Ω 5% 1206
3804	3198 031 13390	4X 33Ω 5% 1206
3805	3198 031 13390	4X 33Ω 5% 1206
3806	3198 031 13390	4X 33Ω 5% 1206
3807	3198 031 03390	33Ω 1% 0402
3808	3198 031 04720	4.7kΩ 5% 0402
3809	3198 031 04720	4.7kΩ 5% 0402
3810	3198 031 04720	4.7kΩ 5% 0402
3813	3198 031 13390	4X 33Ω 5% 1206
3815	4822 117 13545	100Ω 1% 0402
3816	3198 031 02240	220kΩ 5% 0.1W 0402
3817	3198 031 02240	220kΩ 5% 0.1W 0402
3819	4822 117 13545	100Ω 1% 0402
3821	3198 031 03390	33Ω 1% 0402
3822	3198 031 04720	4.7kΩ 5% 0402
3823	3198 031 04720	4.7kΩ 5% 0402
3824	4822 117 13545	100Ω 1% 0402
3825	4822 117 13545	100Ω 1% 0402
3826	4822 117 12917	1Ω 5% 0.062W
3827	4822 117 12917	1Ω 5% 0.062W
3828	4822 117 13605	Jumper 0402
3829	4822 117 13606	10kΩ 5% 0.01W 0402
3830	3198 031 03390	33Ω 1% 0402
3831	3198 031 03920	3.9kΩ 5% 0402
3832	4822 117 13605	Jumper 0402
3833	4822 117 13606	10kΩ 5% 0.01W 0402
3834	4822 117 13545	100Ω 1% 0402
3835	3198 031 03910	390Ω 1% 0402
3836	4822 117 13606	10kΩ 5% 0.01W 0402
3837	4822 117 13606	10kΩ 5% 0.01W 0402
3838	4822 117 13606	10kΩ 5% 0.01W 0402
3839	4822 117 13606	10kΩ 5% 0.01W 0402
3876	3198 031 06890	68Ω 5% 0402
3877	3198 031 06890	68Ω 5% 0402
3879	3198 031 06890	68Ω 5% 0402
3883	3198 031 06890	68Ω 5% 0402
3886	4822 117 13606	10kΩ 5% 0.01W 0402
3887	4822 117 13606	10kΩ 5% 0.01W 0402
3910	4822 117 13602	2.2kΩ 5% 0.01W 0402
3911	4822 117 13548	1kΩ 5% 0402
3930	4822 117 12917	1Ω 5% 0.062W
3931	4822 117 12917	1Ω 5% 0.062W
3932	2322 704 61002	1kΩ 1%
3933	2322 704 63302	3.3kΩ 1% 0603
3951	4822 117 12917	1Ω 5% 0.062W
3952	4822 117 12917	1Ω 5% 0.062W
3953	2322 704 61002	1kΩ 1%
3954	2322 704 63302	3.3kΩ 1% 0603
3955	4822 117 13606	10kΩ 5% 0.01W 0402
3958	3198 031 01530	15kΩ 5% 0.01W 0402
4004	4822 117 13605	Jumper 0402
4006	4822 117 13605	Jumper 0402
4008	4822 117 13605	Jumper 0402
4017	4822 117 13605	Jumper 0402
4018	4822 117 13605	Jumper 0402
4062	4822 117 13605	Jumper 0402
4175	4822 051 30008	Jumper 0603
4177	4822 051 30008	Jumper 0603
4223	4822 051 30008	Jumper 0603
4327	4822 051 30008	Jumper 0603
4331	4822 051 30008	Jumper 0603
4360	4822 117 13605	Jumper 0402
4361	4822 117 13605	Jumper 0402
4362	4822 117 13605	Jumper 0402
4363	4822 117 13605	Jumper 0402
4444	4822 051 30008	Jumper 0603
4580	4822 117 13605	Jumper 0402
4581	4822 117 13605	Jumper 0402
4583	4822 117 13605	Jumper 0402
4590	4822 117 13605	Jumper 0402
4601	4822 117 13605	Jumper 0402
4602	4822 117 13605	Jumper 0402
4603	4822 117 13605	Jumper 0402
4608	4822 117 13605	Jumper 0402
4708	4822 051 30008	Jumper 0603
4714	4822 117 13605	Jumper 0402
4720	4822 051 30008	Jumper 0603

5001	2422 536 00667	1000μF 20% 7032
5002	4822 157 11716	Bead 30Ω at 100MHz
5003	4822 157 11716	Bead 30Ω at 100MHz
5004	4822 157 11716	Bead 30Ω at 100MHz
5005	4822 157 11716	Bead 30Ω at 100MHz
5006	4822 157 11716	Bead 30Ω at 100MHz
5007	4822 157 11716	Bead 30Ω at 100MHz
5008	4822 157 11716	Bead 30Ω at 100MHz
5060	4822 157 11716	Bead 30Ω at 100MHz
5066	3198 018 51080	1μH 10% 0603
5067	3198 018 51080	1μH 10% 0603
5070	4822 157 11716	Bead 30Ω at 100MHz
5071	2422 549 42896	Bead 120Ω 100MHz

5072	2422 549 42896	Bead 120Ω 100MHz
5251	2422 549 45333	Bead 120Ω 100MHz
5252	2422 549 45333	Bead 120Ω 100MHz
5257	2422 549 45333	Bead 120Ω 100MHz
5258	2422 549 45333	Bead 120Ω 100MHz
5262	2422 535 94134	10μH 20% 0805
5267	2422 536 00339	33μ 20%
5268	2422 535 94995	10μF 20% 10145
5304	4822 157 11499	Bead 60Ω at 100MHz
5309	3198 018 31290	12μH 10%
5321	3198 018 33970	0.39μF 10% 0805
5370	4822 157 11716	Bead 30Ω at 100MHz
5371	4822 157 11716	Bead 30Ω at 100MHz
5372	4822 157 11716	Bead 30Ω at 100MHz
5530	2422 549 45333	Bead 120Ω 100MHz
5560	4822 157 11716	Bead 30Ω at 100MHz
5580	4822 157 71304	1μH 10% 0805
5605	2422 549 45333	Bead 120Ω 100MHz
5607	2422 549 45333	Bead 120Ω 100MHz
5636	2422 549 45333	Bead 120Ω 100MHz
5681	2422 549 45333	Bead 120Ω 100MHz
5682	2422 549 45333	Bead 120Ω 100MHz
5688	2422 549 45333	Bead 120Ω 100MHz
5689	2422 549 45333	Bead 120Ω 100MHz
5690	2422 549 45333	Bead 120Ω 100MHz
5691	2422 549 45333	Bead 120Ω 100MHz
5720	4822 157 11716	Bead 30Ω at 100MHz
5721	4822 157 11716	Bead 30Ω at 100MHz
5722	4822 157 11716	Bead 30Ω at 100MHz
5801	2422 549 42896	Bead 120Ω 100MHz
5802	2422 549 42896	Bead 120Ω 100MHz
5803	2422 549 42896	Bead 120Ω 100MHz
5804	2422 549 42896	Bead 120Ω 100MHz
5805	2422 549 42896	Bead 120Ω 100MHz
5874	2422 549 45333	Bead 120Ω 100MHz
5910	2422 536 00667	1000μF 20% 7032
5920	2422 549 45333	Bead 120Ω 100MHz
5930	2422 535 94134	10μH 20% 0805
5931	2422 536 00689	220μF 20%
5932	2422 535 94134	10μH 20% 0805
5952	2422 535 94134	10μH 20% 0805
5953	2422 536 00689	220μF 20%
5954	2422 535 94134	10μH 20% 0805
5956	2422 549 45333	Bead 120Ω 100MHz
5957	2422 549 45333	Bead 120Ω 100MHz
5984	2422 549 45333	Bead 120Ω 100MHz
5985	2422 549 45333	Bead 120Ω 100MHz
5986	2422 549 45333	Bead 120Ω 100MHz
5987	2422 549 45333	Bead 120Ω 100MHz
5988	2422 549 45333	Bead 120Ω 100MHz
5989	2422 549 45333	Bead 120Ω 100MHz
5990	2422 549 45333	Bead 120Ω 100MHz
5991	2422 549 45333	Bead 120Ω 100MHz
5994	2422 549 45333	Bead 120Ω 100MHz
5996	2422 549 45333	Bead 120Ω 100MHz
5997	2422 549 45333	Bead 120Ω 100MHz
5998	2422 549 45333	Bead 120Ω 100MHz



6001	4822 130 11397	BAS316
6005	9340 553 52115	BAS321
6020	4822 130 11397	BAS316
6021	4822 130 11397	BAS316
6073	4822 130 80622	BAT54
6240	4822 130 11397	BAS316
6259	9322 128 70685	SMSS14
6262	3198 010 10720	SS24
6267	3198 010 10730	SS36
6270	4822 130 10837	UDZS8.2B
6328	4822 130 11416	PDZ6.8B
6329	4822 130 11416	PDZ6.8B
6330	4822 130 11416	PDZ6.8B
6331	4822 130 11416	PDZ6.8B
6563	9322 102 64685	UDZ2.7B
6564	4822 130 11416	PDZ6.8B
6565	4822 130 10838	UDZ3.3B
6604	4822 130 11397	BAS316
6605	4822 130 11397	BAS316
6634	9322 102 64685	UDZ2.7B
6635	9322 102 64685	UDZ2.7B
6638	9322 102 64685	UDZ2.7B
6639	9322 102 64685	UDZ2.7B
6692	4822 130 11397	BAS316
6701	9322 102 64685	UDZ2.7B
6910	5322 130 34337	BAV99
6911	9340 548 71115	PDZ33B
6930	9322 128 70685	SMSS14
6951	9322 128 70685	SMSS14



7001	9339 693 90135	BCP69-25
7002	9340 425 20115	BC847BS
7003	9339 693 90135	BCP69-25
7005	9340 547 13215	BSH103
7011	For SW see item 7050	
7012	3198 010 42310	BC847BW
7013	3198 010 42310	BC847BW
7014	3198 010 42310	BC847BW
7015	9322 208 05668	SM NE555D
7016	9322 208 05668	SM NE555D
7017	9322 208 05668	SM NE555D
7018	5322 130 60159	BC846B
7019	5322 130 60159	BC846B
7050	3104 317 08182	SW (check Prod.Surv.)
7051	3104 317 08191	SW (check Prod.Surv.)
7054	3104 317 06681	SW (check Prod.Surv.)
7055	3104 317 07151	SW (check Prod.Surv.)
7070	9340 547 13215	BSH103
7099	4822 209 17226	M24C08-WMN6
7138	5322 130 60159	BC846B
7201	3198 010 42320	BC857BW
7225	3198 010 42310	BC847BW
7226	3198 010 42310	BC847BW
7227	3198 010 42310	BC847BW
7228	3198 010 42310	BC847BW
7240	3198 010 42310	BC847BW
7241	3198 010 42310	BC847BW
7260	9322 139 16668	LF33CPT
7262	9322 202 34668	L5973D
7271	3198 010 42310	BC847BW
7272	3198 010 42310	BC847BW
7370	9340 550 49115	PUMH7
7371	9340 550 49115	PUMH7
7372	9340 550 49115	PUMH7
7376	9340 425 10115	BC857BS
7377	9340 425 10115	BC857BS
7401	9322 206 86671	GM1501-BD
7416	9322 157 51685	SI12301DS
7501	9322 205 70671	K4D263238F-UC50
7530	For SW see item 7051	
7531	9322 156 81668	M24C32-WMN6TNKSA
7532	9352 691 71115	NE56610-27GW
7560	9352 334 10118	TD9178T/N1
7561	3198 010 42310	BC847BW
7562	9322 199 24668	L7808CD2T
7563	4822 209 73852	PMBT2369
7579	4822 130 11155	PDTC114ET
7580	9322 199 16668	M74HC590T
7581	9322 199 16668	M74HC590T
7582	9322 201 05671	CY62256LL-70ZC
7583	9351 870 00118	74HC573PW
7584	9351 870 00118	74HC573PW
7585	3198 010 42310	BC847BW
7604	9352 607 39118	74LVC14APW
7605	4822 209 60792	74HC4053D
7606	9322 199 56668	ADG781BCP
7607	9322 199 80668	SM5301BS-G
7693	For SW see item 7054	
7706	9351 742 70118	74HC08PW
7708	9340 425 20115	BC847BS
7710	9340 310 50215	PDTA143ET
7713	3198 010 42310	BC847BW
7714	3198 010 42310	BC847BW
7740	9322 183 05668	TS4821D
7801	For SW see item 7055	
7806	9965 000 04199	BSN20
7807	9965 000 04199	BSN20
7808	9322 199 35671	SI19993CTG100
7809	9352 703 94118	UDA1334BT/N2
7810	5322 209 14481	HEF4053BT
7887	3198 010 42310	BC847BW
7910	4822 130 42804	BC817-25
7920	9322 163 24668	L78M08CDT
7930	5322 209 90529	MC34063AD
7952	5322 209 90529	MC34063AD
7954	9322 157 51685	SI12301DS
7955	4822 130 11155	PDTC114ET
7992	9322 142 88668	LF25CDT
7995	9322 189 19668	LD1086D2T18

0046	3122 121 67191	Clip small
0047	3104 301 24561	Spring
0048	3104 301 24561	Spring
0049	3122 121 67191	Clip small
0051	3104 304 90401	Insulating plate
0052	3104 304 90401	Insulating plate
0053	3104 304 90401	Insulating plate
0054	3104 304 90401	Insulating plate
0305	3104 304 23841	Xtal grommet
1007▲	4822 071 55002	Fuse T5A 250V
1304	2422 025 10647	Connector 4p m
1305	4822 267 10735	Connector 3p
1306▲	2422 025 16374	Connector 2p m
1307	2422 025 10647	Connector 4p m
1308▲	4822 265 20723	Connector 2p
1309	2422 025 11143	Connector 3p m
1400▲	2422 086 00208	Fuse 4A T 250V
1401▲	4822 252 11224	Fuse 1A T 250V
1402	4822 252 60151	Surge protect
1410	4822 265 11253	Fuse holder
1411	4822 265 11253	Fuse holder
1450▲	2422 132 07411	Relay 1p 5V 5A G5PA-1
1M02	2422 025 11244	Connector 7p m

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2000▲	2252 811 95022	1.5nF 20% 250V
2002	4822 124 11767	470μF 20% 25V
2003	4822 124 80061	1000μF 20% 25V
2007	4822 126 14583	470nF 10% 16V 0805
2008	4822 126 14583	470nF 10% 16V 0805
2009	2238 867 18101	100pF 1% 50V 0603
2010	4822 124 40207	100μF 20% 25V
2011	2022 333 00119	10nF 5% 1.6kV
2011	2222 375 24153	15nF 5% 1kV
2012	4822 126 13862	1.5nF 10% 2kV
2012	4822 126 14138	680pF 10% 2kV
2013	4822 126 13862	1.5nF 10% 2kV
2013	4822 126 14138	680pF 10% 2kV
2014▲	4822 126 13451	2.2nF 10% 2kV
2015	5322 126 11583	10nF 10% 50V 0603
2016	2238 586 59812	100nF 20% 50V 0603
2017	2022 333 00119	10nF 5% 1.6kV
2017	2222 375 24153	15nF 5% 1kV
2019	5322 126 11583	10nF 10% 50V 0603
2020	2020 021 00012	2200μF 20% 16V
2020	4822 124 12285	2200μF 20% 16V
2021	2020 021 00012	2200μF 20% 16V
2021	4822 124 12285	2200μF 20% 16V
2022	2020 021 00039	1800μF 20% 35V
2022	4822 124 81168	2200 μF 20% 35V
2023	4822 126 14583	470nF 10% 16V 0805
2024	2020 552 96326	220nF 10% 16V
2025	2020 552 96683	220nF 10% 50V
2026	4822 126 14238	2.2nF 50V 0603
2028	5322 126 11578	1nF 10% 50V 0603
2029	5322 126 11578	1nF 10% 50V 0603
2033	2020 552 96683	220nF 10% 50V
2034	2238 867 18101	100pF 1% 50V 0603
2035	2238 867 18101	100pF 1% 50V 0603
2038	2020 021 00039	1800μF 20% 35V
2038	4822 124 81168	2200 μF 20% 35V
2039	4822 126 14583	470nF 10% 16V 0805
2040	4822 126 14249	560pF 10% 50V 0603
2041	2020 552 96683	220nF 10% 50V
2042	2020 552 96683	220nF 10% 50V
2043	2020 552 96683	220nF 10% 50V
2044	5322 126 11578	1nF 10% 50V 0603
2045	5322 126 11578	1nF 10% 50V 0603
2046	3198 017 34730	47nF 16V 0603
2047	5322 126 11583	10nF 10% 50V 0603
2048	5322 126 11578	1nF 10% 50V 0603
2050	5322 126 11578	1nF 10% 50V 0603
2051	2020 552 96683	220nF 10% 50V
2052	2020 552 96683	220nF 10% 50V
2053	2020 552 96683	220nF 10% 50V
2060	4822 126 14238	2.2nF 50V 0603
2061	4822 126 14238	2.2nF 50V 0603
2062	4822 126 14238	2.2nF 50V 0603
2063	4822 126 13881	470pF 5% 50V
2064	4822 126 13881	470pF 5% 50V
2065	4822 126 14238	2.2nF 50V 0603
2071	5322 126 11578	1nF 10% 50V 0603
2072	5322 126 11578	1nF 10% 50V 0603
2077	4822 126 14238	2.2nF 50V 0603
2290	5322 126 11583	10nF 10% 50V 0603
2291	4822 126 13881	470pF 5% 50V
2292	4822 124 12417	2200μF 20% 25V
2293	4822 126 13881	470pF 5% 50V
2294	4822 124 12417	2200μF 20% 25V
2400▲	2222 338 22474	470nF 20% 275V
2401▲	2222 338 22474	470nF 20% 275V
2407▲	2252 811 95017	470pF 10% 250V

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2407▲	2252 811 95065	220pF 10% 250V
2503	2020 024 90718	10μF 20% 450V
2803	2222 365 55563	56nF 10% 400V
2804	2222 365 55563	56nF 10% 400V
2815	2020 024 90748	820μF 20% 250V
2816	2020 024 00002	820μF 20% 250V
2816	2020 024 90748	820μF 20% 250V

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3000▲	4822 052 10478	4.7Ω 5% 0.33W
3001	4822 051 30101	100Ω 5% 0.062W
3002	4822 051 30223	22kΩ 5% 0.062W
3002	4822 051 30393	39kΩ 5% 0.062W
3003	4822 117 13632	100kΩ 1% 0603 0.62W
3004	4822 051 30273	27kΩ 5% 0.062W
3005	4822 051 30333	33kΩ 5% 0.062W
3006	4822 051 30103	10kΩ 5% 0.062W
3007	4822 051 30103	10kΩ 5% 0.062W
3008	4822 051 30331	330Ω 5% 0.062W
3009	4822 051 30332	3.3Ω 5% 0.062W
3010	4822 051 30471	47Ω 5% 0.062W
3011	4822 051 30471	47Ω 5% 0.062W
3012	4822 051 30153	15kΩ 5% 0.062W
3013	4822 051 30103	10kΩ 5% 0.062W
3014▲	4822 052 10101	100Ω 5% 0.33W
3015▲	4822 052 10479	47Ω 5% 0.33W
3016	4822 051 30332	3.3Ω 5% 0.062W
3017▲	4822 052 10101	100Ω 5% 0.33W
3018▲	4822 052 10479	47Ω 5% 0.33W
3019	4822 051 30332	3.3Ω 5% 0.062W
3020	4822 051 30332	3.3Ω 5% 0.062W
3021	4822 117 12139	22Ω 5% 0.062W
3021	9965 000 23109	22Ω 5% 0603
3022	4822 051 30681	680Ω 5% 0.062W
3023	4822 051 30153	15kΩ 5% 0.062W
3024	2322 704 63303	33kΩ 1% 0603
3025	3198 021 31820	1.8kΩ 5% 0.062W 0603
3025	4822 117 12903	1.8kΩ 1% 0.063W 0603
3026	2120 368 90118	Potm. lin. 470Ω hor.
3026	4822 101 11383	Potm. 470Ω 30% linear
3027	4822 117 13632	100kΩ 1% 0603 0.62W
3028	4822 051 30332	3.3Ω 5% 0.062W
3029	4822 051 30332	3.3Ω 5% 0.062W
3030	4822 051 30183	18kΩ 5% 0.062W
3031	4822 051 30103	10kΩ 5% 0.062W
3032	4822 051 30103	10kΩ 5% 0.062W
3033▲	4822 052 11108	1Ω 5% 0.5W
3034	4822 051 30102	1kΩ 5% 0.062W
3035	4822 051 30332	3.3Ω 5% 0.062W
3040	5322 117 13056	8.2kΩ 1% 0.063W 0603
3041	4822 051 30333	33kΩ 5% 0.062W
3043	4822 051 30109	10Ω 5% 0.062W
3045	4822 117 12139	22Ω 5% 0.062W
3045	9965 000 23109	22Ω 5% 0603
3046	4822 117 12139	22Ω 5% 0.062W
3046	9965 000 23109	22Ω 5% 0603
3047	4822 051 30479	47Ω 5% 0.062W
3048	4822 051 30272	2.7kΩ 5% 0.062W
3050	4822 050 28204	820kΩ 1% 0.6W
3052	2322 704 61603	1kΩ 1% 0603
3052	2322 704 67502	7.5kΩ 1% 0.5W
3053	4822 050 26804	680kΩ 1% 0.6W
3055	4822 051 30221	220Ω 5% 0.062W
3056	4822 051 30221	220Ω 5% 0.062W
3056	4822 117 12968	820Ω 5% 0.62W
3057	4822 051 30221	220Ω 5% 0.062W
3058	4822 053 20565	5.6MΩ 5% 0.25W
3061	4822 051 30683	68kΩ 5% 0.062W
3064	4822 051 30103	10kΩ 5% 0.062W
3065	4822 117 13632	100kΩ 1% 0603 0.62W
3066	4822 051 30103	10kΩ 5% 0.062W
3067	4822 051 30101	100Ω 5% 0.062W
3068	4822 051 30222	2.2kΩ 5% 0.062W
3070	4822 051 30102	1kΩ 5% 0.062W
3071	4822 051 30103	10kΩ 5% 0.062W
3075	4822 051 30102	1kΩ 5% 0.062W
3089	4822 051 30103	10kΩ 5% 0.062W
3100	4822 051 30102	1kΩ 5% 0.062W
3101	4822 051 30102	1kΩ 5% 0.062W
3292	4822 051 30561	560Ω 5% 0.062W
3400▲	2122 550 00158	VDR 1mA 612V
3401▲	4822 053 21475	4.7MΩ 5% 0.5W
3402▲	4822 053 21475	4.7MΩ 5% 0.5W
3403▲	4822 053 21475	4.7MΩ 5% 0.5W
3404	4822 116 83872	220Ω 5% 0.5W
3450	2322 252 41108	1Ω 10% 7W
3810	2322 257 41123	12kΩ 5% 5W
3999	4822 051 30683	68kΩ 5% 0.062W
9002	4822 051 30008	Jumper 0603
9009	4822 051 30008	Jumper 0603
9030	4822 051 30008	Jumper 0603
9085	4822 051 30008	Jumper 0603

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5001	2422 531 02444	Transformer S13932-04Y
5002▲	3104 308 21231	Transf. 2652.0001A
5005	4822 526 10704	Bead 50 Ω at 100MHz
5007	4822 526 10704	Bead 50 Ω at 100MHz
5008	4822 526 10704	Bead 50 Ω at 100MHz
5009	4822 157 11411	Bead 80Ω at 100MHz
5010	4822 157 11411	Bead 80Ω at 100MHz
5013	4822 526 10704	Bead 50 Ω at 100MHz
5015	4822 157 11411	Bead 80Ω at 100MHz
5016	4822 157 11411	Bead 80Ω at 100MHz
5017	4822 526 10704	Bead 50 Ω at 100MHz
5025	4822 526 10704	Bead 50 Ω at 100MHz
5026	4822 526 10704	Bead 50 Ω at 100MHz
5027	4822 526 10704	Bead 50 Ω at 100MHz
5028	4822 526 10704	Bead 50 Ω at 100MHz
5040	4822 157 11411	Bead 80Ω at 100MHz
5291	2422 536 00776	33μH 10%
5292	2422 536 00776	33μH 10%
5293	2422 536 00776	33μH 10%
5401▲	2422 549 43563	Filt. 23MHz 3A DMF3520
5402▲	2422 549 43563	Filt. 23MHz 3A DMF3520

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6002	4822 130 11397	BAS316
6003	4822 130 11397	BAS316
6004	4822 130 80622	BAT54
6005	4822 130 80622	BAT54
6006	4822 130 11397	BAS316
6007	4822 130 11397	BAS316
6008	4822 130 11397	BAS316
6009	4822 130 11152	UDZ18B
6010	4822 130 11397	BAS316
6011	4822 130 11397	BAS316
6012	9322 197 30685	SML4744
6012	9322 208 80685	BZG05C15
6013	9322 197 30685	SML4744
6013	9322 208 80685	BZG05C15
6014	9340 548 67115	PD222B
6015	4822 130 11397	BAS316
6017	4822 130 11397	BAS316
6020	4822 130 11397	BAS316
6021	9322 206 26687	STPS20H100CT
6022	4822 130 11148	UD24.7B
6023	4822 130 11397	BAS316
6025	9322 206 26687	STPS20H100CT
6027	4822 130 11397	BAS316
6028	4822 130 11397	BAS316
6044	9322 207 11687	STPS20L45CT
6045	9322 207 11687	STPS20L45CT
6051	4822 130 11397	BAS316
6077	9322 202 55685	BYG22D
6078	9322 202 55685	BYG22D
6079	9322 202 55685	BYG22D
6080	9322 202 55685	BYG22D
6081	9340 548 67115	PD222B
6154	9322 099 61685	BYG10J
6155	9322 099 61685	BYG10J
6291	4822 130 11572	STPS8H100F
6293	4822 130 11572	STPS8H100F
6460	4822 130 11397	BAS316
6461	4822 130 11397	BAS316
6506▲	4822 130 83147	DF06M
6807▲	9322 199 74682	GBJ6J-B15

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7001	9322 108 21682	MC34067P
7002▲	9322 149 04682	TCET1102
7004	3198 010 42310	BC847BW
7005	9322 192 18687	STP15NK50ZFP
7005	9322 205 26687	FQPF18N50V2
7006	9322 192 18687	STP15NK50ZFP
7006	9322 205 26687	FQPF18N50V2
7007	3198 010 42320	BC857BW
7008	3198 010 42320	BC857BW
7009	3198 010 42320	BC857BW
7010	9322 125 09668	TL431AD
7017	3198 010 42320	BC857BW
7018	3198 010 42310	BC847BW
7030	3198 010 42310	BC847BW

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3D Comb Filter [CB]

Various

1801	2422 025 15
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3103	4822 051 30331	330Ω 5% 0.062W
3105	4822 051 30681	680Ω 5% 0.062W
3106	4822 051 30151	150Ω 5% 0.062W
3107	4822 051 30471	47Ω 5% 0.062W
3108	4822 051 30103	10kΩ 5% 0.062W
3109	4822 051 30101	100Ω 5% 0.062W
3120	4822 051 30472	4.7Ω 5% 0.062W
3121	4822 051 30103	10kΩ 5% 0.062W
3122	4822 051 30332	3.3Ω 5% 0.062W
3123	4822 051 30332	3.3Ω 5% 0.062W
3124	4822 051 30102	1kΩ 5% 0.062W
3126	2322 702 60335	3.3MΩ 5% 0603
3127	2322 702 60335	3.3MΩ 5% 0603
3128	4822 051 30472	4.7Ω 5% 0.062W
4101	4822 051 30008	Jumper 0603
4107	4822 051 30008	Jumper 0603
4108	4822 051 30008	Jumper 0603
4111	4822 051 30008	Jumper 0603



5100	2422 549 43769	Bead 30Ω at 100MHz
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6101	4822 130 11564	UDZ3.9B
6103	4822 130 83915	TLMV3100
6105	4822 130 11564	UDZ3.9B
6127	9322 140 63685	TEMD5000



7103	3198 010 42320	BC857BW
7105	3198 010 42320	BC857BW
7107	9322 206 81667	TSOP34836YA1
7120	5322 209 82941	LM358D

LCD Stand-by / Audio [SA]

Various

0040	4822 492 62076	Transistor clamp
0050	4822 492 62076	Transistor clamp
0260	4822 404 31443	Relief
0341	3104 301 24561	Spring
1304	2422 025 10647	Connector 4p m
1305	4822 267 10735	Connector 3p
1306▲	2422 025 16374	Connector 2p m
1307	2422 025 10647	Connector 4p m
1309	2422 025 11143	Connector 3p m
1312	2422 025 18166	Connector 16p m
1313	2422 025 18166	Connector 16p m
1315	2422 025 10771	Connector 10p m
1317	2422 025 10772	Connector 12p m
1735	2422 025 10768	Connector 3p m
1735	4822 267 10918	Connector 3p
1736	2422 025 10768	Connector 3p m
1739	2422 025 10769	Connector 9p m
1M02	2422 025 11244	Connector 7p m
1M03	2422 025 10771	Connector 10p m
1M10	2422 025 09406	Connector 4p m
1M46	2422 025 10655	Connector 11p m



2101	4822 121 51598	2.2nF 5% 400V
2102	4822 124 40207	100μF 20% 25V
2103	2020 552 94427	100pF 5% 50V
2105	2020 552 94427	100pF 5% 50V
2107	2020 024 90718	10μF 20% 450V
2108	2020 024 90718	10μF 20% 450V
2109	2022 552 05679	1μF 10% 16V 0805
2110	2022 552 05679	1μF 10% 16V 0805
2111	4822 121 43526	47nF 5% 250V
2112	5322 126 11583	10nF 10% 50V 0603
2123	2238 586 59812	100nF 20% 50V 0603
2124	4822 124 40248	10μF 20% 63V
2129	5322 126 11578	1nF 10% 50V 0603
2131	2238 586 15641	22nF 10% 50V 0603
2132	4822 124 40207	100μF 20% 25V
2140	4822 124 40248	10μF 20% 63V
2141	4822 126 14583	470nF 10% 16V 0805
2144	2022 552 05679	1μF 10% 16V 0805
2145	4822 126 13881	470pF 5% 50V
2149	2022 552 05679	1μF 10% 16V 0805
2150	4822 124 12379	220μF 25V
2152▲	4822 121 70162	10nF 5% 400V
2153	5322 126 11582	6.8nF 10% 63V
2154	3198 017 31530	15nF 20% 50V 0603
2160	4822 124 21913	1μF 20% 63V

2163	4822 124 40207	100μF 20% 25V
2506▲	2252 811 95017	470pF 10% 250V
2507	4822 126 13682	100pF 5% 1kV
2508	4822 124 40764	22μF 100V
2510	2020 021 91668	2200μF 20% 10V
2511	4822 124 12379	220μF 25V
2513	4822 126 10206	2.2nF 10% 500V
2515	4822 126 14238	2.2nF 50V 0603
2533	4822 124 40207	100μF 20% 25V
2534	2022 552 05679	1μF 10% 16V 0805
2535	5322 126 11583	10nF 10% 50V 0603
2536	5322 126 11583	10nF 10% 50V 0603
2537	4822 126 14238	2.2nF 50V 0603
2538	5322 126 11583	10nF 10% 50V 0603
2539	2022 552 05679	1μF 10% 16V 0805
2540	5322 126 11583	10nF 10% 50V 0603
2544	5322 126 11583	10nF 10% 50V 0603
2701	4822 124 12379	220μF 25V
2702	5322 126 11578	1nF 10% 50V 0603
2704	5322 126 11578	1nF 10% 50V 0603
2705	2020 552 96684	470nF 10% 25V 0805
2706	2222 580 15649	100nF 10% 50V 0805
2707	4822 126 14585	100nF 10% 0805 50V
2708	2020 552 96326	220nF 10% 16V
2709	4822 126 13881	470pF 5% 50V
2710	4822 126 13881	470pF 5% 50V
2711	5322 126 11578	1nF 10% 50V 0603
2712	2020 552 96683	220nF 10% 50V
2713	2020 552 96684	470nF 10% 25V 0805
2714	3198 017 33330	33nF 20% 16V 0603
2715	5322 126 11578	1nF 10% 50V 0603
2716	4822 126 14241	330pF 0603 50V
2717	5322 121 42498	680nF 5% 63V
2718	4822 122 33761	22pF 5% 50V
2719	5322 126 11578	1nF 10% 50V 0603
2720	2020 552 96326	220nF 10% 16V
2721	4822 126 13881	470pF 5% 50V
2722	4822 126 13881	470pF 5% 50V
2725	2020 552 94427	100pF 5% 50V
2726	3198 017 33330	33nF 20% 16V 0603
2727	5322 126 11578	1nF 10% 50V 0603
2728	4822 126 14241	330pF 0603 50V
2729	5322 121 42498	680nF 5% 63V
2764	4822 126 14491	2.2μF 10V 0805
2766	4822 126 14491	2.2μF 10V 0805
2768	4822 124 40255	100μF 20% 63V
2769	4822 124 40255	100μF 20% 63V
2777	2020 552 96683	220nF 10% 50V
2778	4822 124 40769	4.7μF 20% 100V
2779	2020 552 96683	220nF 10% 50V
2780	2020 552 96683	220nF 10% 50V
2781	2020 552 96683	220nF 10% 50V
2783	4822 124 41751	47μF 20% 50V
2785	4822 124 12379	220μF 25V
2786	2238 586 15641	22nF 10% 50V 0603
2786	4822 124 12379	220μF 25V
2788	4822 124 40255	100μF 20% 63V
2789	2020 552 96683	220nF 10% 50V
2790	4822 124 40255	100μF 20% 63V



3100	4822 051 30101	100Ω 5% 0.062W
3101	4822 053 20475	4.7MΩ 5% 0.25W
3102	2312 915 11002	1kΩ 1% 0.5W
3102	3198 039 10020	1kΩ 1% 0.5W
3103	2312 915 11002	1kΩ 1% 0.5W
3103	3198 039 10020	1kΩ 1% 0.5W
3104	4822 051 30479	47Ω 5% 0.062W
3105	4822 051 30221	220Ω 5% 0.062W
3106	4822 051 30391	390Ω 5% 0.062W
3107	4822 051 30391	390Ω 5% 0.062W
3108	4822 053 10478	4.7Ω 5% 1W
3109	4822 051 30391	390Ω 5% 0.062W
3110	4822 051 30391	390Ω 5% 0.062W
3111	4822 053 10152	1.5kΩ 5% 1W
3112	4822 051 30391	390Ω 5% 0.062W
3113	4822 117 12139	22Ω 5% 0.062W
3113	9965 000 23109	22Ω 5% 0603
3114	4822 051 30221	220Ω 5% 0.062W
3117	4822 051 30479	47Ω 5% 0.062W
3122	4822 051 30471	47Ω 5% 0.062W
3123	4822 051 30109	10Ω 5% 0.062W
3124	4822 051 30339	33Ω 5% 0.062W
3125	4822 117 12971	15Ω 5% 0603 0.62W
3126	4822 051 30103	10kΩ 5% 0.062W
3127	4822 051 30562	5.6kΩ 5% 0.063W 0603
3128	4822 117 13608	4.7Ω 5% 0603 0.62W
3132	4822 051 30333	33kΩ 5% 0.062W
3134	4822 051 30102	1kΩ 5% 0.062W
3135	4822 051 30331	330Ω 5% 0.062W
3138	4822 051 30105	1MΩ 5% 0.062W
3140	4822 051 30223	22kΩ 5% 0.062W

3141	4822 051 30471	47Ω 5% 0.062W
3142	4822 051 30123	12kΩ 5% 0.1W
3145	4822 051 30472	4.7Ω 5% 0.062W
3146	4822 051 30479	47Ω 5% 0.062W
3147	4822 051 30223	22kΩ 5% 0.062W
3148	4822 051 30479	47Ω 5% 0.062W
3149	4822 051 30103	10kΩ 5% 0.062W
3150	4822 051 30101	100Ω 5% 0.062W
3152	4822 051 30102	1kΩ 5% 0.062W
3153	4822 051 30223	22kΩ 5% 0.062W
3155	4822 050 21003	10kΩ 1% 0.6W
3156	4822 051 30102	1kΩ 5% 0.062W
3157	4822 051 30223	22kΩ 5% 0.062W
3158	4822 051 30479	47Ω 5% 0.062W
3159	4822 051 30479	47Ω 5% 0.062W
3160	4822 051 30102	1kΩ 5% 0.062W
3161	4822 051 30123	12kΩ 5% 0.1W
3171	4822 051 30101	100Ω 5% 0.062W
3172	4822 051 30333	33kΩ 5% 0.062W
3175	4822 051 30103	10kΩ 5% 0.062W
3176	4822 051 30103	10kΩ 5% 0.062W
3509	4822 053 10222	2.2kΩ 5% 1W
3511	4822 051 30683	68kΩ 5% 0.062W
3512	4822 051 30471	47Ω 5% 0.062W
3513	4822 051 30333	33kΩ 5% 0.062W
3515	4822 117 13632	100kΩ 1% 0603 0.62W
3516	4822 051 30472	4.7Ω 5% 0.062W
3517	4822 051 30223	22kΩ 5% 0.062W
3528	4822 051 30472	4.7Ω 5% 0.062W
3529	4822 051 30101	100Ω 5% 0.062W
3530	4822 051 30223	22kΩ 5% 0.062W
3531	4822 051 30153	15kΩ 5% 0.062W
3532	4822 051 30472	4.7Ω 5% 0.062W
3533	4822 051 30152	1.5Ω 5% 0.062W
3534	4822 051 30103	10kΩ 5% 0.062W
3535	4822 051 30222	2.2kΩ 5% 0.062W
3536	4822 051 30103	10kΩ 5% 0.062W
3538	4822 051 30101	100Ω 5% 0.062W
3539	4822 051 30471	47Ω 5% 0.062W
3540	4822 051 30222	2.2kΩ 5% 0.062W
3541	4822 051 30222	2.2kΩ 5% 0.062W
3542	4822 051 30103	10kΩ 5% 0.062W
3544	4822 051 30221	220Ω 5% 0.062W
3560	4822 051 30682	6.8Ω 5% 0.062W
3561	4822 051 30392	3.9Ω 5% 0.063W 0603
3562	4822 117 13608	4.7Ω 5% 0603 0.62W
3701	4822 051 30103	10kΩ 5% 0.062W
3702	4822 051 30682	6.8Ω 5% 0.062W
3703	4822 051 30333	33kΩ 5% 0.062W
3704	4822 117 10833	10kΩ 1% 0.1W
3705	4822 051 20828	8.2Ω 5% 0.1W
3706	4822 051 30472	4.7Ω 5% 0.062W
3707	4822 051 30683	68kΩ 5% 0.062W
3708	4822 051 30563	56kΩ 5% 0.062W
3709	4822 117 11503	220Ω 1% 0.1W
3710	4822 051 30223	22kΩ 5% 0.062W
3711	4822 050 21204	120kΩ 1% 0.6W
3712	4822 051 30103	10kΩ 5% 0.062W
3713	2312 915 11202	1.2kΩ 1% 0.5W
3714	4822 117 12925	47kΩ 1% 0.063W 0603
3715	4822 117 12925	47kΩ 1% 0.063W 0603
3716	4822 117 12925	47kΩ 1% 0.063W 0603
3717	4822 117 13632	100kΩ 1% 0603 0.62W
3718	4822 117 13632	100kΩ 1% 0603 0.62W
3721	4822 051 30472	4.7Ω 5% 0.062W
3722	4822 051 30683	68kΩ 5% 0.062W
3723	4822 051 30563	56kΩ 5% 0.062W
3724	4822 117 11503	220Ω 1% 0.1W
3725	4822 051 30223	22kΩ 5% 0.062W
3726	4822 117 11503	220Ω 1% 0.1W
3727	4822 117 11503	220Ω 1% 0.1W
3743	4822 117 11449	2.2kΩ 5% 0.1W 0805
3746	4822 051 30223	22kΩ 5% 0.062W

3768	4822 051 30103	10kΩ 5% 0.062W	7102	9322 194 27687	STP3NK60ZFP
3768	4822 117 13632	100kΩ 1% 0603 0.62W	7105	3198 010 42320	BC857BW
3790	4822 051 30222	2.2kΩ 5% 0.062W	7131	9340 557 69127	PHX9NQ20T
3790	4822 051 30682	6.8Ω 5% 0.062W	7140	3198 010 42310	BC847BW
3791	4822 051 30222	2.2kΩ 5% 0.062W	7150▲	9322 149 04682	TCET1102
3791	4822 051 30682	6.8Ω 5% 0.062W	7501▲	9322 149 04682	TCET1102
3792	4822 051 30153	15kΩ 5% 0.062W	7505	3198 010 42320	BC857BW
3792	4822 051 30183	18kΩ 5% 0.062W	7506	3198 010 42310	BC847BW
3792	4822 051 30682	6.8Ω 5% 0.062W	7507	3198 010 42310	BC847BW
3793	4822 051 30153	15kΩ 5% 0.062W	7508	3198 010 42310	BC847BW
3793	4822 051 30183	18kΩ 5% 0.062W	7509	3198 010 42310	BC847BW
3793	4822 051 30682	6.8Ω 5% 0.062W	7511	9337 331 10215	BST82
3798	4822 051 30153	15kΩ 5% 0.062W	7512	9340 422 80115	PMSTA42
3999	4822 051 30472	4.7Ω 5% 0.062W	7531	9340 436 50115	BSP030
9020	4822 051 30008	Jumper 0603	7532	3198 010 42310	BC847BW
9717	4822 051 30008	Jumper 0603	7560	9340 219 30115	BC817-25W
9737	4822 051 30008	Jumper 0603	7700	9322 163 86682	TDA7490L



5102	4822 526 10704	Bead 50 Ω at 100MHz
5103	4822 526 10704	Bead 50 Ω at 100MHz
5104	4822 157 11411	Bead 80Ω at 100MHz
5105	4822 157 11716	Bead 30Ω at 100MHz
5106	3198 018 31090	10μH 10% 0805
5108	4822 526 10704	Bead 50 Ω at 100MHz
5110	4822 157 71736	10μH 5%
5500▲	3104 308 21181	Transf. BS25320-00
5500▲	8204 000 76901	Transformer BS25320-00
5504	2422 536 00776	33μH 10%
5505	4822 157 11411	Bead 80Ω at 100MHz
5506	4822 157 11411	Bead 80Ω at 100MHz
5507	2422 536 00433	15μH 10%
5701	2422 536 00385	68μH 10%
5701	2422 536 00951	68μH 20% LHL10
5702	2422 536 00385	68μH 10%
5702	2422 536 00951	68μH 20% LHL10
5703	4822 157 11716	Bead 30Ω at 100MHz
5705	4822 157 11716	Bead 30Ω at 100MHz
5707	4822 157 11411	Bead 80Ω at 100MHz
5708	4822 157 11411	Bead 80Ω at 100MHz
5711	4822 157 11411	Bead 80Ω at 100MHz
5712	4822 157 11411	Bead 80Ω at 100MHz
5730	2422 549 00112	Line filt. 50V 3A
5731	2422 549 00112	Line filt. 50V 3A



6103▲	4822 130 10871	SBYV27-200
6104	9340 548 69115	PDZ27B
6105	4822 130 11522	UDZ15B
6106	9340 548 66115	PDZ20B
6108	4822 130 80622	BAT54
6114▲	4822 130 10871	SBYV27-200
6115	4822 130 80622	BAT54
6116	3198 020 55680	BZX384-C5V6
6120	4822 130 11397	BAS316
6121	4822 130 11397	BAS316
6122	9322 129 34685	BZM55-C3V9
6130	9340 548 61115	PDZ12B
6132	4822 130 11416	PDZ6.8B
6133	4822 130 11397	BAS316
6134	4822 130 11397	BAS316
6140	4822 130 41487	BYV95C
6142	4822 130 80622	BAT54
6144	4822 130 11397	BAS316
6147	9322 200 23685	SML4736
6147	9322 208 44685	BZG05C6V8
6148	4822 130 11397	BAS316
6149	3198 020 55680	BZX384-C5V6
6150	9340 292 50135	BZG03-C200
6151	9340 548 71115	PDZ33B
6153	9340 292 50135	BZG03-C200
6156	4822 130 11397	BAS316
6504	9340 418 70133	BYV27-600
6505	9322 161 78682	SB360L-7024
6511	9340 548 61115	PDZ12B
6531	4822 130 11522	UDZ15B
6532	4822 130 11397	BAS316
6540	4822 130 80622	BAT54
6562	9340 548 67115	PDZ22B
6701	4822 130 11397	BAS316
6702	4822 130 11551	UDZS10B
6703	4822 130 11551	UDZS10B
6704	4822 130 11397	BAS316



7100	3198 010 42320	BC857BW
7101	9340 219 30115	BC817-25W
7102	4822 130 11417	STP3NB60FP
7102	9322 160 34687	FQPF3N60

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Update of manual including:
 - Text chapters are updated and minor corrections are made.
 - Blockdiagrams are added.
 - Schematics are updated and minor corrections are made.

Manual xxxx xxx xxxx.2

- Update of manual including:
 - Text chapters are updated and minor corrections are made.
 - Blockdiagrams and schematics are updated and minor corrections are made.
 - Chapter 8 “Alignments”: White Tone Alignment updated.
 - Chapter 10 “Spare Parts” updated

Manual xxxx xxx xxxx.3

- Chapter 1:
 - PWB CB (3D Comb filter) added to “Chassis overview”.
- Chapter 7 “Circuit Diagrams and PWB layouts”:
 - To improve readability, the PWB layout of the SA panel is splitted in 2 parts.
- Chapter 8 “Alignments”:
 - Default values of White Tone Alignment added.
 - Backlight Voltage Alignment added.
- Chapter 9: Lip sync description added.
- All chapters: small textual and graphical improvements.